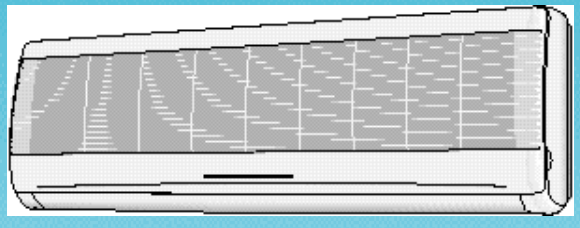
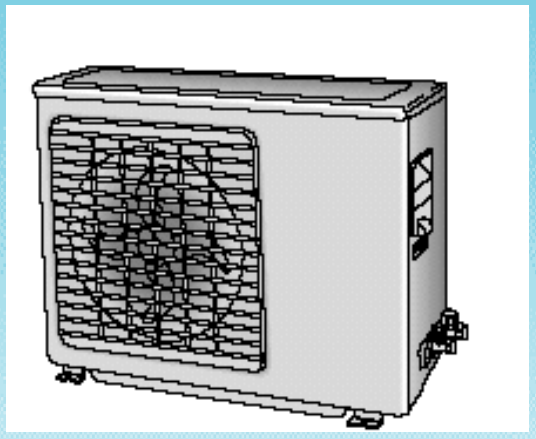
ROOM AIR CONDITIONER

INDOOR UNIT	OUTDOOR UNIT
AS07A1VE	US07A1VE
AS09A1VE/B	US09A1VE/B
AS12A1VE/B	US12A1VE/B

SERVICE Manual

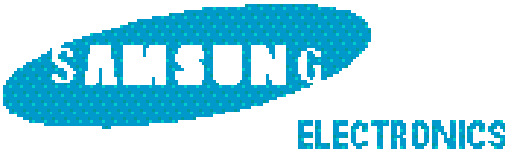
AIR CONDITIONER





CONTENTS

1. Precautions
2. Product Specifications
3. Operating Instructions and Installation
4. Disassembly and Reassembly
5. Troubleshooting
6. Exploded Views and Parts List
7. Block Diagrams
8. PCB Diagrams
9. Wiring Diagrams
10. Schematic Diagrams



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1. Precautions

1. Warning: Prior to repair, disconnect the power cord from the circuit breaker.

2. Use proper parts: Use only exact replacement parts. (Also, we recommend replacing parts rather than repairing them.)

3. Use the proper tools: Use the proper tools and test equipment, and know how to use them. Using defective tools or test equipment may cause problems later-intermittent contact, for example.

4. Power Cord: Prior to repair, check the power cord and replace it if necessary.

5. Avoid using an extension cord, and avoid tapping into a power cord. This practice may result in malfunction or fire.

6. After completing repairs and reassembly, check the insulation resistance. Procedure: Prior to applying power, measure the resistance between the power cord and the ground terminal. The resistance must be greater than 30 megohms.

7. Make sure that the grounds are adequate.

8. Make sure that the installation conditions are satisfactory. Relocate the unit if necessary.

9. Keep children away from the unit while it is being repaired.

10. Be sure to clean the unit and its surrounding area.

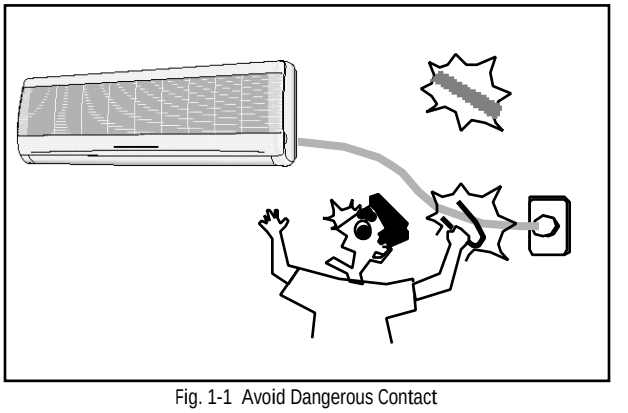

Fig. 1-1 Avoid Dangerous Contact

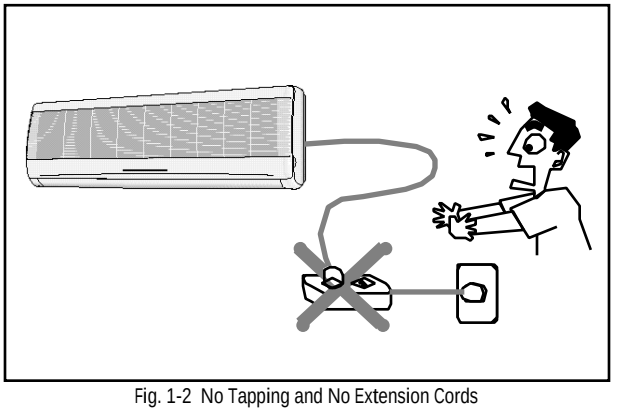

Fig. 1-2 No Tapping and No Extension Cords

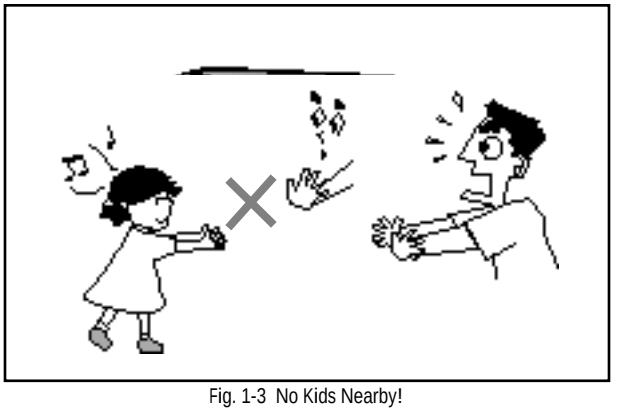

Fig. 1-3 No Kids Nearby!

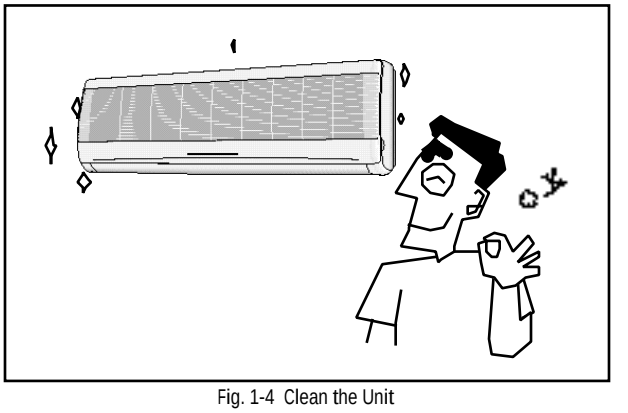

Fig. 1-4 Clean the Unit

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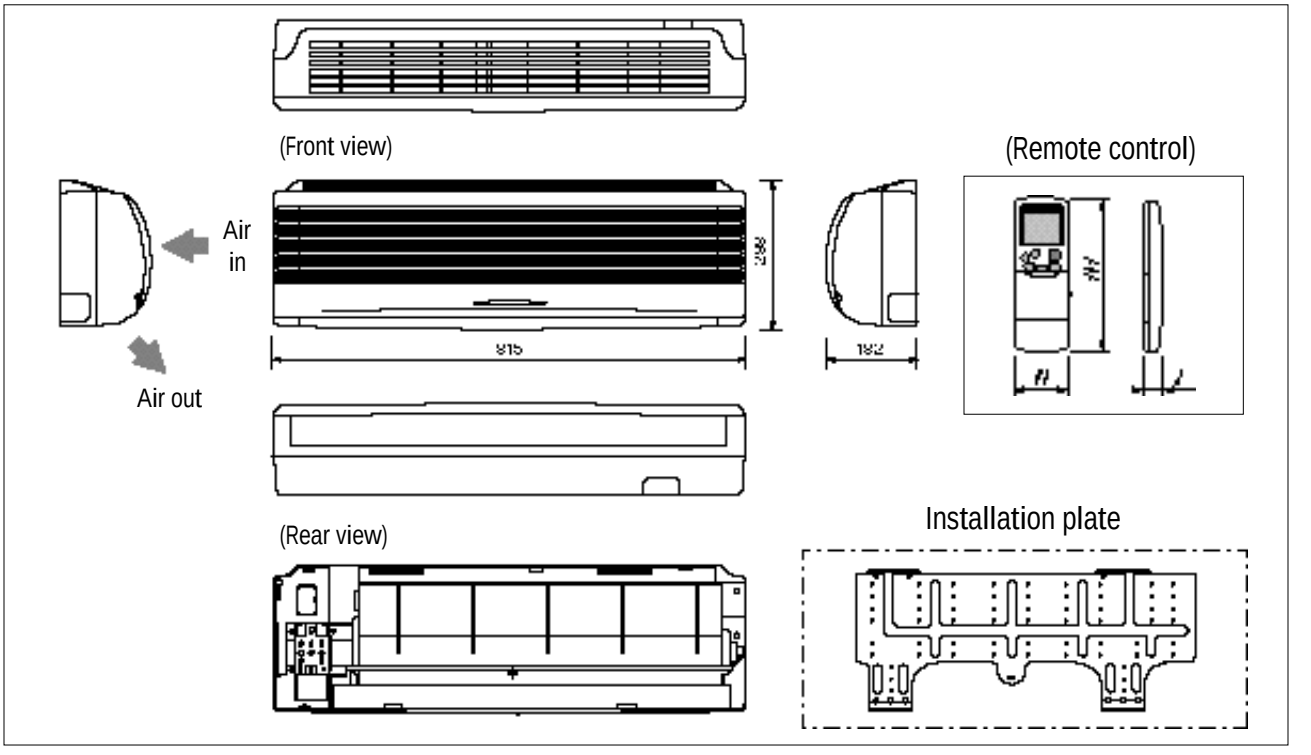
2. Product Specifications

2-1 Table

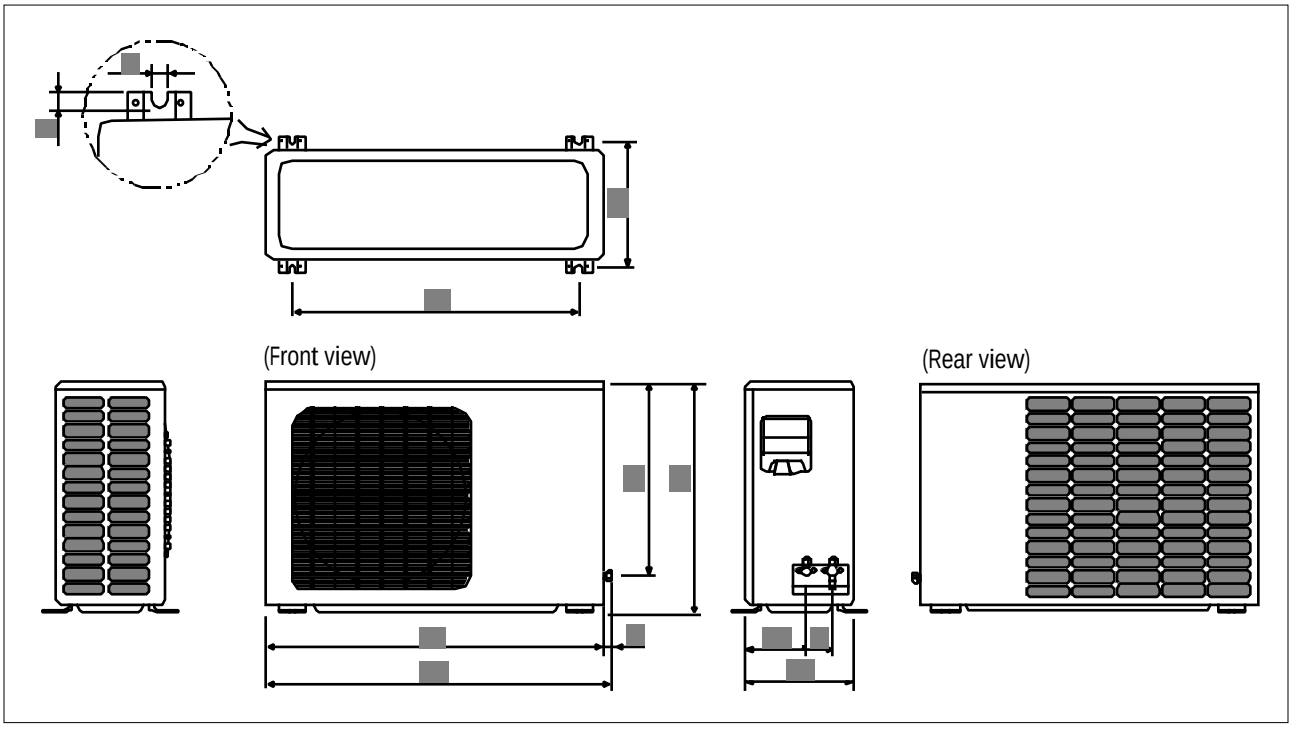
Item			Model	AS07A1VE		AS09A1VE		AS12A1VE		AS09A1VB		AS12A1VB	
				Indoor unit	Outdoor unit	Indoor unit	Outdoor unit	Indoor unit	Outdoor unit	Indoor unit	Outdoor unit	Indoor unit	Outdoor unit
Type			-	Wall-mounting		Wall-mounting		Wall-mounting		Wall-mounting		Wall-mounting	
Perfor-mance	Cooling		BTU/h	7,500		9,000		12,000		9,000		12,000	
	Dehumiditying		l/h	1.2		1.6		1.9		1.6		1.9	
	Air volume	Cooling	m3/min	6.0		6.1		7.8		6.1		7.8	
	Noise	Cooling	dB	35	45	35	45	38	49	36	47	39	50
	Energy efficiency ratio	Cooling	BTU/h.W	11.2		10.2		10.2		10.2		9.4	
	Power		V/Hz	1/220 - 240~/50		1/220 - 240~/50		1/220 - 240~/50		1/220/60		1/200/60	
Power	Power Consumption	Cooling	W	670		880		1180		880		1280	
	Operating Current	Cooling	A	2.8		4.0		5.0		4.0		5.8	
	Power factor	Cooling	%	99.7		91.7		98.3		99.9		99.9	
	Starting current		A	17.0		22.0		30.0		24.0		31.0	
	Power cord	Length	m	2	-	2	-	2	-	2	-	2	-
		Number of core wire		250V 10/16A		250V 10/16A		250V 10/16A		250V 10/16A		250V 10/16A	
	Fuse capacity		A	3.15	-	3.15	-	3.15	-	3.15	-	3.15	-
Size	Outer dimension	Width x Height x Depth	mm	815x298x182	720x532x245	815x298x182	720x532x245	815x298x182	720x532x245	815x298x182	720x532x245	815x298x182	720x532x245
			inch	32.08x11.73x7.17	28.35x20.94x9.65	32.08x11.73x7.17	28.35x20.94x9.65	32.08x11.73x7.17	28.35x20.94x9.65	32.08x11.73x7.17	28.35x20.94x9.65	32.08x11.73x7.17	28.35x20.94x9.65
	Weight		kg	9.6	27	9.6	28	9.6	31	9.6	27	9.6	31
	Refrigerant pipe	Liquid	OD(mm)x L(m)	ø6.35 x 5		ø6.35 x 5		ø6.35 x 5		ø6.35 x 5		ø6.35 x 5	
		GAS		ø9.52 x 5		ø9.52 x 5		ø12.7 x 5		ø9.52 x 5		ø12.7 x 5	
	Drain hose		ID(mm)x L(m)	ø17 x 2000		ø17 x 2000		ø17 x 2000		ø17 x 2000		ø17 x 2000	
	Compressor	Type		-	Rotary	-	Rotary	-	Rotary	-	Rotary	-	Rotary
		Motor Type		-	-	-	-	-	-	-	-	-	-
		Rated output	W	-	675	-	895	-	1210	-	879	-	1300
	Blower	Type		Cross-fan	Propeller	Cross-fan	Propeller	Cross-fan	Propeller	Cross-fan	Propeller	Cross-fan	Propeller
		Motor Type		Resin	Steel	Resin	Steel	Resin	Steel	Resin	Steel	Resin	Steel
		Rated output	W	35	15	35	15	35	20	35	20	35	20
Heat exchanger				2Row 12Step	1Row 20Step	2Row 12Step	1Row 20Step	2Row 12Step	2Row 20Step	2Row 12Step	1Row 20Step	2Row 12Step	2Row 20Step
Refrigerant control unit				CAPILLARY TUBE		CAPILLARY TUBE		CAPILLARY TUBE		CAPILLARY TUBE		CAPILLARY TUBE	
Freezer oil capacity				280		360		410		360		410	
Refrigerant to change(R-22)				670		680		930		660		880	
Protection device				-	MST24AMN-12008	-	MRA12037-12007	-	MRA12030-12008	-	MRA12093-12007	-	MRA12002-9200
Cooling test Condition				INDOOR UNIT : DB27°C WB19°C		OUTDOOR UNIT : DB35°C WB24°C				INDOOR UNIT : DB27°C WB19.5°C		OUTDOOR UNIT : DB35°C WB24°C	
Maximum operation Condition				INDOOR UNIT : DB32°C WB23°C		OUTDOOR UNIT : DB43°C WB26°C				INDOOR UNIT : DB32°C WB22.5°C		OUTDOOR UNIT : DB43°C WB25.5°C	

2-2 Dimensions

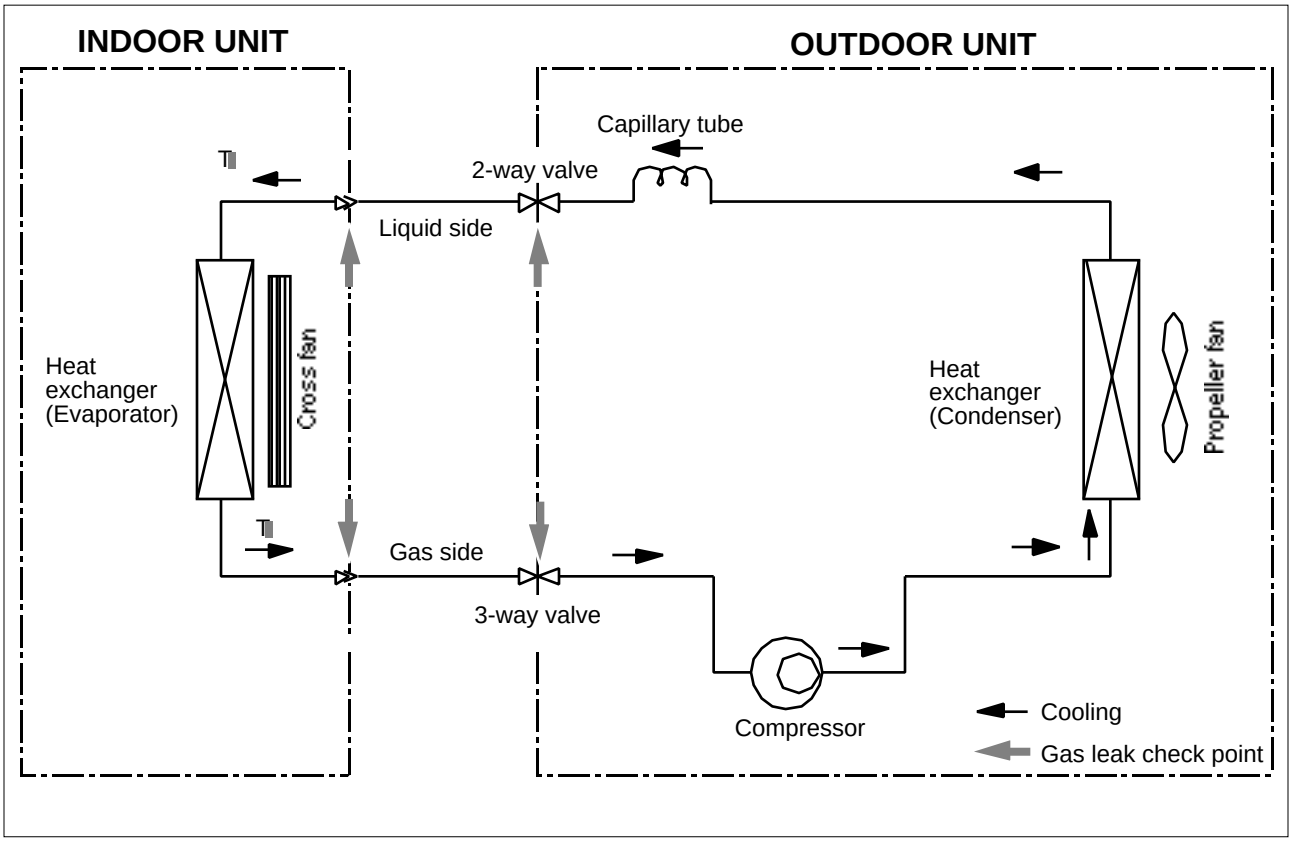
2-2-1 Indoor Unit



2-2-1 Outdoor Unit



2-3 Refrigerating Cycle Block Diagram



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3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Name & Function of Key in remote controller

NO		NAMED OF KEY		FUNCTION OF KEY
1				On/Off Button. Use this button to start and stop air conditioner.
2			▲ (UP)	Temp. up button. If the ▲ button is pressed once, the setting temperature is increased by 1°C
			▼ (DOWN)	Temp. up button. If the ▼ button is pressed once, the setting temperature is decreased by 1°C
3		MODE		Each time you press this button, MODE is changed in the following order. : Auto Mode : Fan Only : Cool Mode : Dry Mode
4		TURBO		Use this button to provide heavy duty cooling & Heating for 30 minutes.
5		OFF		Set up the reserve or cancel the timer on and timer off quickly
6				Use this button for sleep operation. (The SLEEP mode can be selected at COOL and HEAT mode.)
7				Adjusts air flow vertically. Each time you press this button.
8				Each time you press this button, FAN SPEED is changed in the following order.
9	COVER	TIMER	ON TIMER	Set up the time that operation start.
10			OFF TIMER	Set up the time that operation stop.
11			SET	Use this button to reserve the timer on.
12			CANCEL	Use this button to reserve or cancel the timer on and timer off.
13			(UP)	If the button is pressed once, the time increase by one minute during the time set mode, and ten minutes during the timer set mode.
14			(DOWN)	If the button is pressed once, the time decrease by one minute during the time set mode, and ten minutes during the timer set mode.
15			TIME	Without regard to ON/OFF condition in remote controller, use this button to set current time. Adjust the current time using button. (Data can be transmitted after setting up the time)

3-1-1 Name & Function of Key in remote controller

1. AUTO MODE : In this mode, operation COOL mode is selected automatically by the room temperature of initial operation.

Operation Type	Room Temp	
Cool Operation	Tr≥ 24.5°C+ΔT	Compressor ON
	Tr≤ 24°C+ΔT	Compressor OFF

   ΔT= -1°, -2°C, 0°C+1°C+2°C
   ΔT is controlled by setting temperature up / down key of remote controller
   * FAN SPEED : AUTO

2. COOL MODE : The unit operates according to the difference between the setting and room temperature. (18°C~30°C)

3. DRY MODE : Has 3 states, each determined by room temperature.
   The unit operates in DRY mode.
   *Compressor ON / OFF Time is controlled compulsorily(can not set up the fan speed, always breeze).
   *Protective function : Low temperature release. (Prevention against freeze)

4. TURBO MODE : This mode is available in AUTO, COOL, DRY, FAN MODE.
   When this button is pressed at first, the air conditioner is operated “powerful” state for 30 minutes regardless of the set temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.
   *But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

5. SLEEP MODE : Sleep mode is available only in COOL mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.

6. FAN SPEED : Manual (3 step), Auto (4 step) Fan speed automatically varies depending on both the difference between setting and the room temperature.

7. COMPULSORY OPERATION :
   For operating the air conditioner without the remote controller.
   *AUTO : The operating is the same function that AUTO MODE in the remote controller.

8. SWING : BLADE-H is rotated vertically by the stepping motor.
   *Memory louver : When ON / OFF button is pressed at stop state, the BLADE-H returns to its original location which is operating state before stop
   *Swing Set : Press the utton under the remote control is disp..y..d on LCD the and the blades move up and down, abou..s . If the one more time press the utton, blades location is stop.

9. Quick OFF TIMER: OFF timer (quick timer) allows reservation or cancel the timer on and timer off quickly
   When OFF timer button is pressed at operating state, LCD displays the polling state sequentially.
   The LCD also displays the time remaining.

10. 24-Hour ON / OFF Real Setting Timer. : The air conditioner is turned ON at a specified time using ON TIMER.
    OFF TIMER : The air Conditioner is turned OFF at a specified time using OFF TIMER.
    *ON TIMER : Only timer LED lights on.
    *OFF TIMER : Both timer and operation LED lights on.
    *3 minutes delay timer.

11. SELF Diagnosis

LED DISPLAY				Check Point
operation	TIMER	FAN	Turbo	
■	○	○	○	Interruption of electric power and Power on.
○	■	○	○	Abnormal condition of the room sensor.
■	■	○	○	Abnormal condition of the indoor unit's heat exchanger sensor.
○	○	■	○	Indoor unit fan motor lock.

■ : LED blinking ○ : LED off

12. BUZZER SOUND : Whenever the ON / OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep"

3-2 Installation

3-2-1 Selecting Area for Installation

Select an area for installation that is suitable to the customer's needs.

3-2-1(a) Indoor Unit

1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.

3-2-1(b) Outdoor Unit

1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light.
   (Install a separate sunblind if exposed to direct sun light.)
2. Make sure that you install the outdoor unit in area allowing good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours.
   (Fix the unit firmly if it is mounted in a high place.)
3. Make sure that you install the outdoor unit in area providing good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
4. Make sure that you install the outdoor unit in area free from animals or plants.
5. Make sure that you install the outdoor unit in area not blocking the traffic.
6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe(10 meters).

   Note
   1. Add 10 grams of refrigerant (R-22) for every 1 meter if the pipe length exceeds the standard pipe length of 5 meters.
   2. Maintain a height between the indoor and outdoor units of less than 3 meters.
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

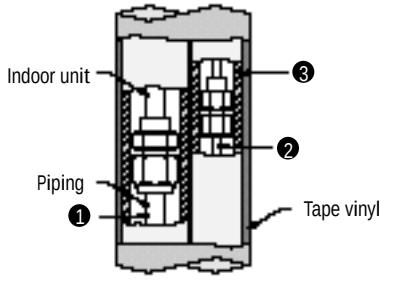
3-2-1(c) Remote Control Unit

1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).

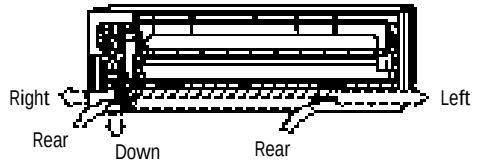
Caution :
It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.

3-2-2 Installation diagram of indoor unit and outdoor unit

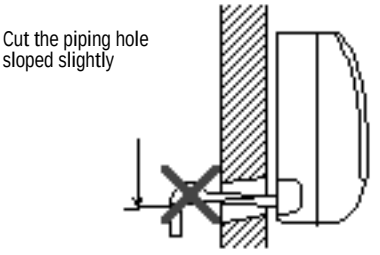
A Indoor unit gas leak test check point

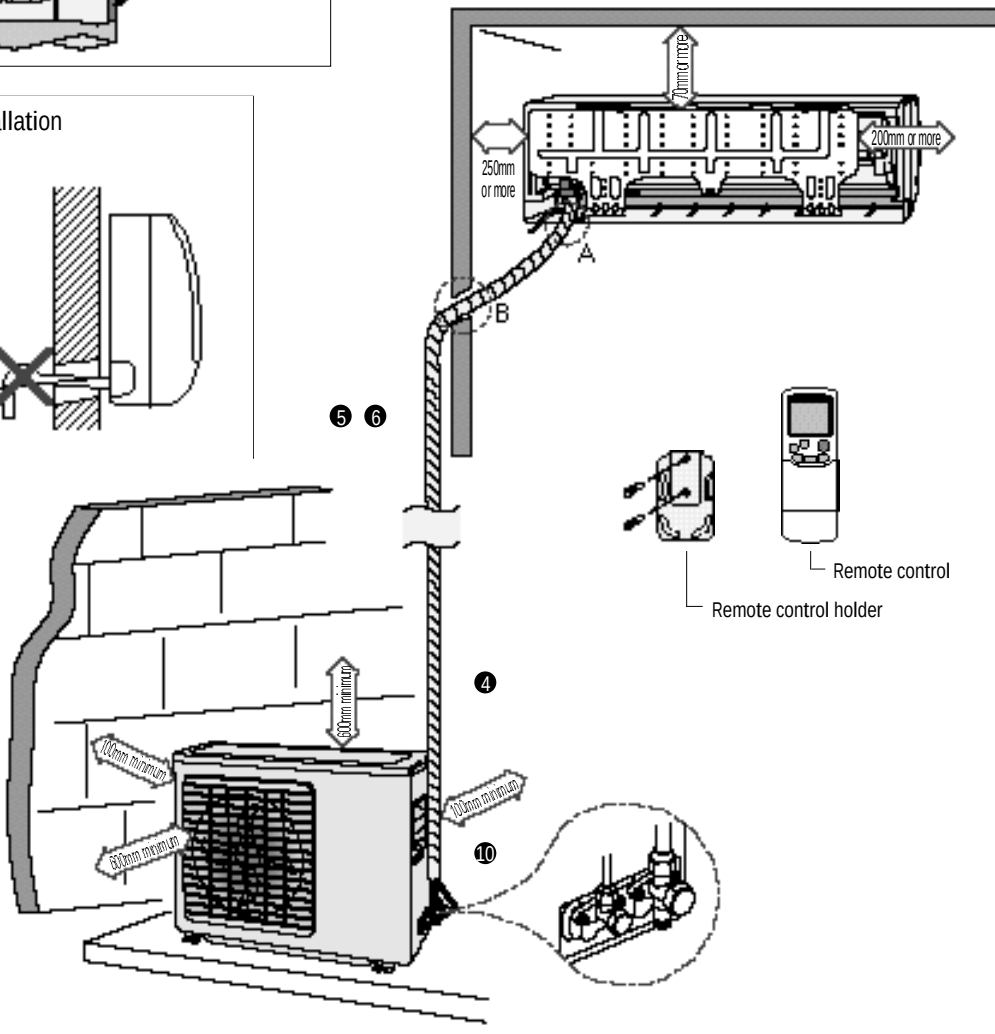


Piping may be laid to the rear, left, right or down .



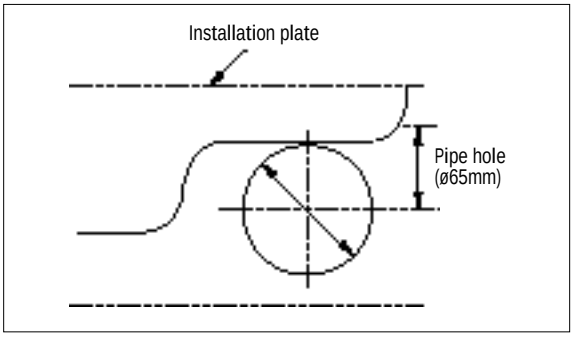
B Drain hose installation





❶	Piping (Liquid) 1/4"		❻	Clamper tube
❷	7K/9K BTU 12K BTU	Piping(Gas)3/8" Piping(Gas)1/2"	❼	Installation plate
❸	Installation tube		❽	Pipe-connection
❹	Vinyl tape		❾	Screw
❺	Putty		❿	Drain hose

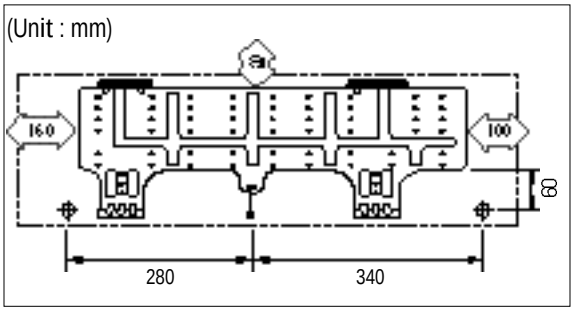
3-2-2(a) Fixing the Installation Plate



1. Determine the position of the pipe and drain hose hole using the right figure and drill the hole with an inner diameter of 65mm so that it slants slightly downwards.

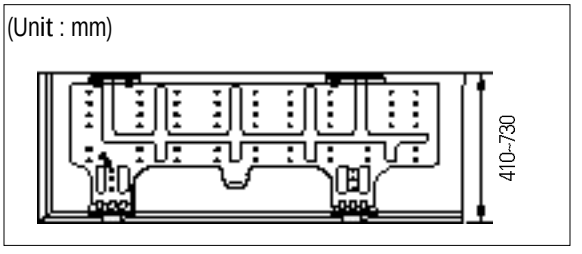
2. **If you are fixing the indoor unit to a… Then follow Steps…**

Wall	**3.**
Window frame	**4 to 6.**



3. Fix the installation plate to the wall in a manner appropriate to the weight of the indoor unit.

   If you are mounting the plate on a concrete wall with anchor bolts, the anchor bolts must not project by more than 20mm.

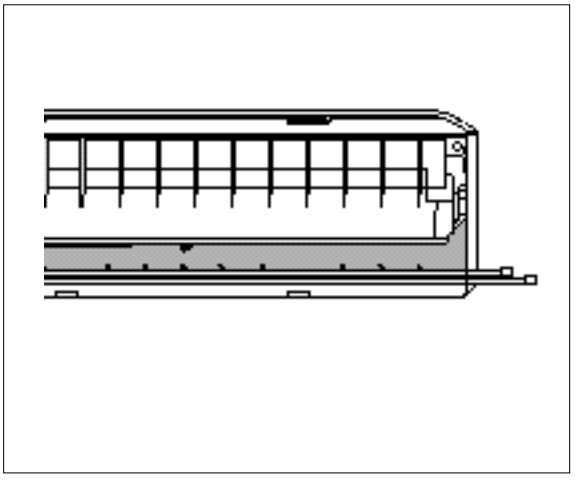


4. Determine the positions of the wooden uprights to be attached to the window frame.

5. Attach the wooden uprights to the window frame in a manner appropriate to the weight of the indoor unit.

6. Using tapped screws, attach the installation plate to the wooden uprights, as illustrated in the last figure opposite.

3-2-2(b) Purging the Unit



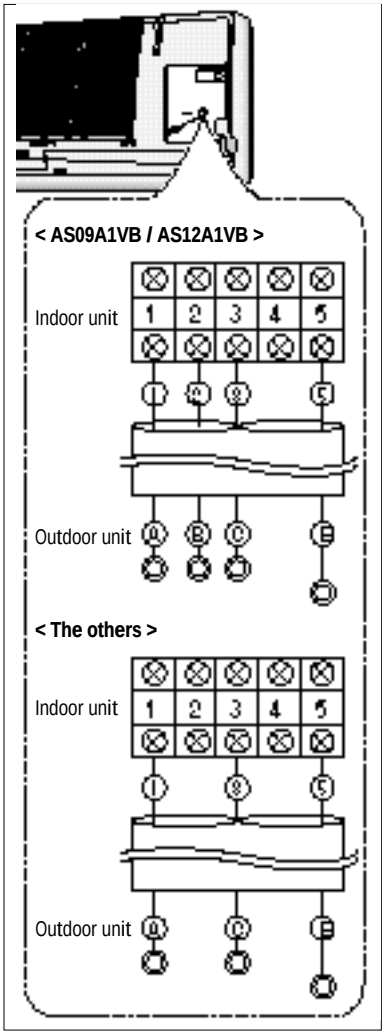
On delivery, the indoor unit is loaded with an inert gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as fol - lows.

Unscrew the caps at the end of each pipe.

Result : All inert gas escapes from the indoor unit.

- **To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove the caps completely until you are ready to connect the piping.**

3-2-2(c) Connecting the Assembly Cable.

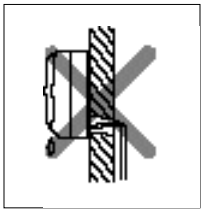


The outdoor unit is powered from the indoor unit via the assembly cable. If the outdoor unit is more than five metres away from the indoor unit, the cable must first be extended to a maximum of ten metres.

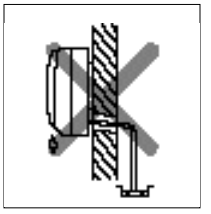
1. Extend the assembly cable if necessary.
2. Open the front grille by pulling on the tabs on the lower right and left sides of the indoor unit.
3. Remove the screw securing the connector cover.
4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals 1, 3, 5(1,2,3,5).
   - Each wire is labelled with the corresponding terminal number.
5. Pass the other end of the cable through the 65mm hole in the wall.
6. Replace the connector cover, carefully tightening the screw.
7. Close the front grille.
8. For further details on how to plug the other end of the assembly cable into the outdoor unit, refer to page 12.

3-2-2(d) Installing and Connecting the Indoor Unit Drain Hose

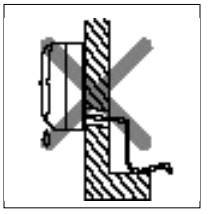
Care must be taken when installing the drain hose for the indoor unit to ensure that any condensa - tion water is correctly drained outside.l When passing the drain hose through the 65mm hole drilled in the wall, check that none of the following situations occur.



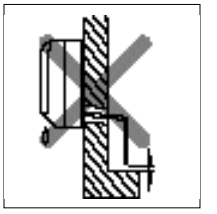
The hose must NOT slope upw ards.



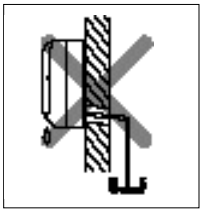
The end of the drain hose must NOT be placed in water.



Do NOT bend the hose in different directions.



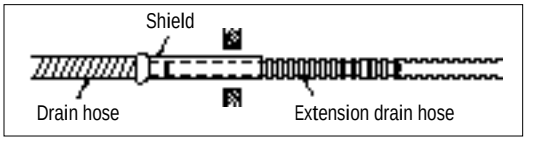
Keep a clearance of at least 5cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.

To install the drain hose, proceed as follows.

1. If necessary, connect the 2-metre extension to the drain hose.
2. If you are using the extension, insulate the inside part of the extension drain hose with a shield.
3. Pass the drain hose under the refrigerant piping, taking care to keep the drain hose tight.
4. Pass the drain hose through the hole in the wall, making sure that it is sloping downwards, as shown in the illustrations above.

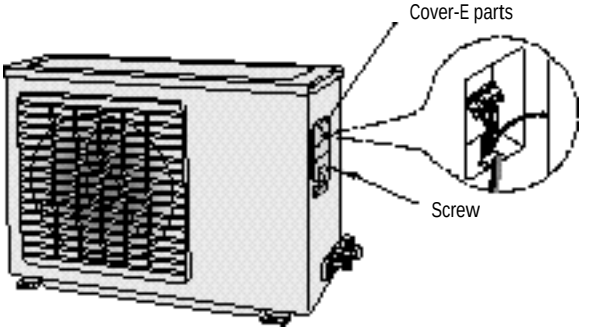


The hose will be fixed permanently into position once the whole installation has been tested for gas leaks; refer to page 16 for further details.

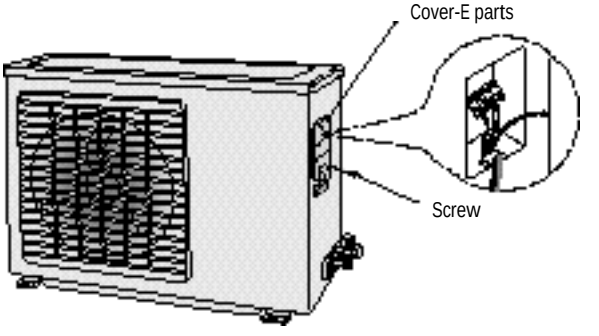
3-2-2(e) Outdoor unit installation

Wiring connection

1. Remove the cover-E parts.
2. Firmly connect the cable connector in the terminal block.
3. Fasten the M4 ring terminal to the hole marked
4. Firmly fix the ass'y cable with clamp wire holder.
5. Assemble the cover-E parts.
6. To prevent the entry of water, form a trap of the ass'y cable as illustrated in the installation dia- gram of indoor and outdoor unit.



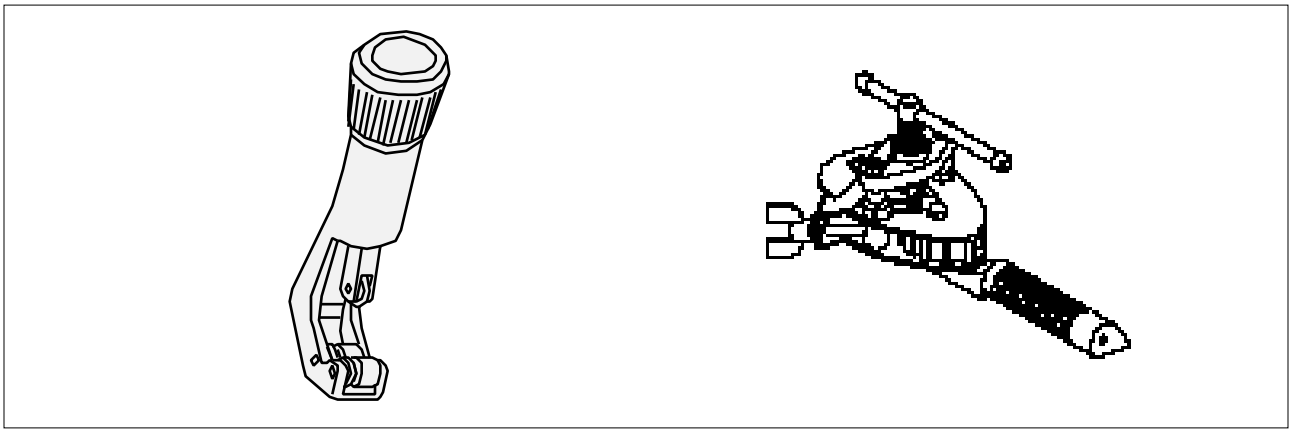
<AS12A1VB/AS09A1VB ONLY>



<OTHERS MODEL>

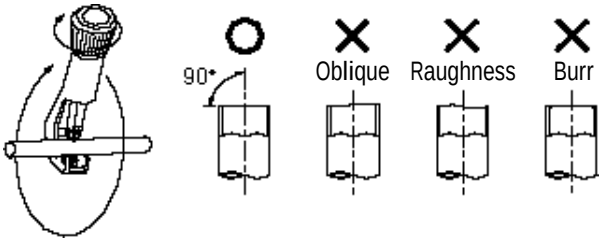
3-2-2(f) Flare Modification

• Tools used



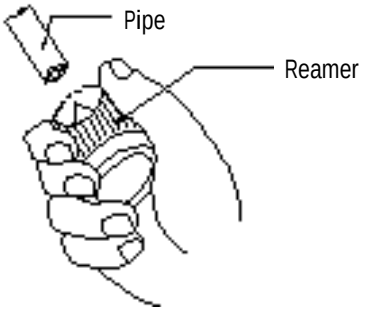
Flare modification procedure

1) Cut the pipe using a pipe cutter.

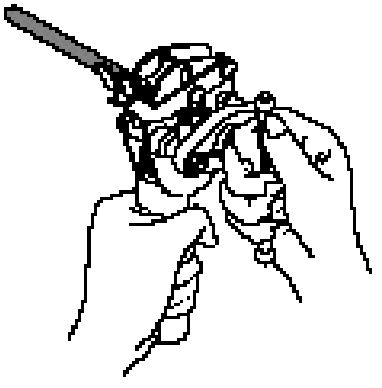


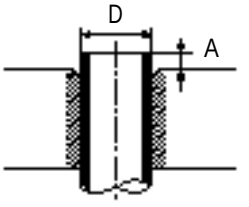
2) Remove burrs at the tip of the pipe cut.

Caution : Burrs not removed may result in leakage of gas.



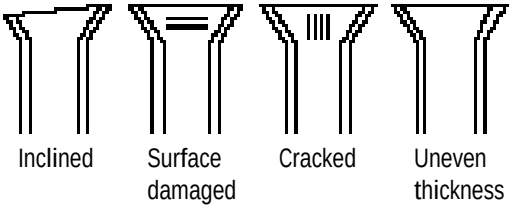
3) Insert a flare nut into the pipe and modifty flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø9.52mm	1.8
ø12.7mm	2.0

* Unproper flaring



3-2-2(g) Air-Purge Procedure

• Use the refrigerant of the outdoor unit to purge air inside indoor unit and pipe.

1. Remove the caps from the 2-way valve(B) and the 3-way valve(A).

↓

2 Turn the 2-way valve cock approx. 45° counterclockwise to open it. Close it about 10 seconds later.

↓

3 Check refrigerant leakage of each joint parts (A, B, C & D in right figure)

↓

not leaking

Leaking

If leaking, tighten the flare nut one more time. If continues to leak, although the pipe fixing area has been tightened again, repair the leaking area.

4. Open the 2-way valve again.

↓

5. Open the service valve cap of the 3-way valve and press the needle valve to discharge gas for 3 seconds and leave it for about 1 minute.
Repeat the above procedure for 3 times to purge air.

↓

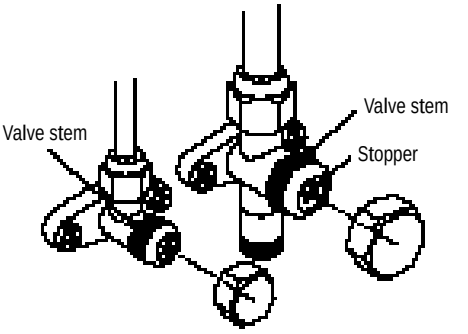
6. Open the 2-way valve and 3-way valve completely

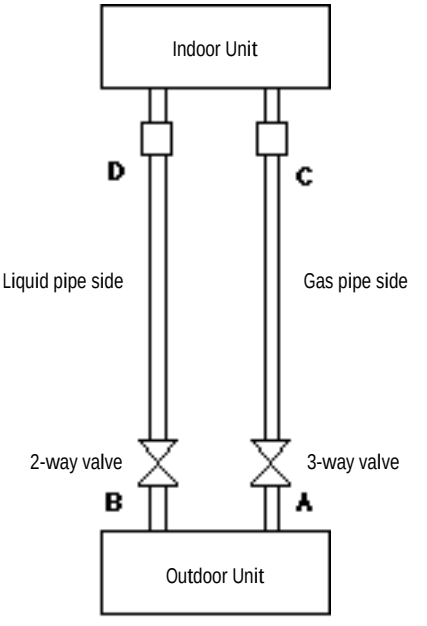
↓

7. Close the cap of each valve.

↓

8. Check each valve for leakage.





3-2-2(h) Refrigerant Refill

• Refill an air-conditioner with refrigerant when refrigerant has been leaked at installing or using

1. Purge air(for new installation only).

↓

2. Turn the 3-way valve clockwise to close, connect the pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.

↓

3. Connect the tank to refill with Refrigerant

↓

4. Set the unit to cool operation mode.

↓

5. Check the pressure indicated by the pressure gauge(low pressure side).
   * Standard pressure is should be 4.5~5.5kg/cm^2 in a regular, high operation mode.

↓

6. Open the refrigerant tank and fill with refrigerant until the rated pressure is reached.
   * It is recommended not to pour the refrigerant in too quickly, but gradually while operating a pressure valve.

↓

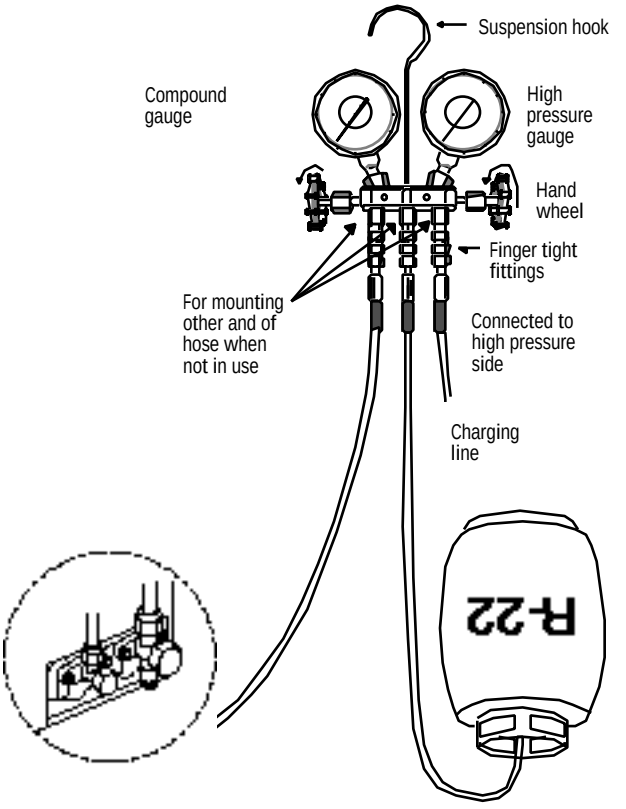
7. Stop operation of the air conditioner.

↓

8. Close the 3-way valve, disconnect the pressure gauge, and open the 3-way valve again.

↓

9. Close the cap of each valve.



3-2-2(i) Refrigerant Adjustment

Class	At installation		At service	
Connection Pipe Length	Air-Purge Method	Refrigerant Adjustment	Air-Purge Method	Refrigerant Quantity
5m Max.	Refer to the detailed Air-Purge Procedure	Unnecessary	Purge air using a vaccum pump or an additional refrigerant cylinder.	refer to specification sheet
5~10m		Add 10g of refrigerant (R-22) for every 1m.		Add 10g of refrigerant (R-22) for every 1m.

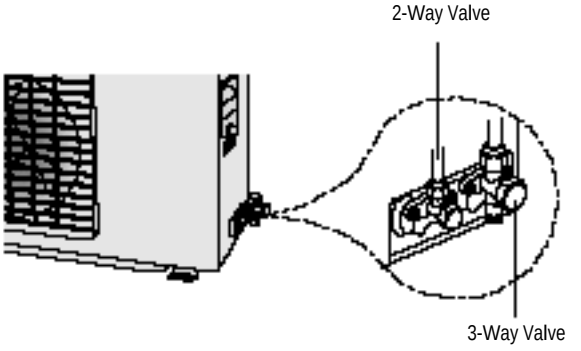
3-2-2(j) Flare unt fixing torque

Outter diameter	Torque (kg-cm)	
	Fixing Torque	Final Torque
ø 6.35 (9000Btu, 12000Btu) (Liquid Side)	160	200
ø 9.52 (9000Btu) (Gas Side)	300	350
ø 12.7 (12000Btu) (Gas Side)	500	550

3-2-2(k) "Pump down" Procedure

- Pump down' shall be carried out when an evaporator is replaced or when the unit is relocated in another area.

1. Remove the caps from the 2-way valve and the 3-way valve.
2. Turn the 3-way valve clockwise to close and connect a pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.
3. Set the unit to cool operation mode. (Check if the compressor is operating.)
4. Turn the 2-way valve clockwise to close.
5. When the pressure gauge indicates "0" turn the 3-way valve clockwise to close.
6. Stop operation of the air conditioner.
7. Close the cap of each valve.



Relocation of the air conditioner

- Refer to this procedure when the unit is relocated.

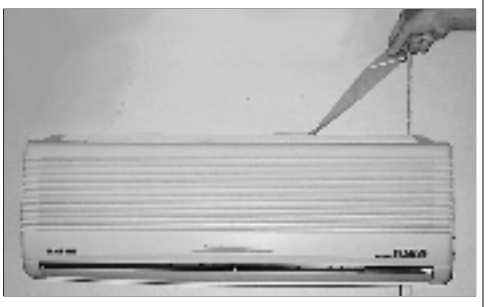
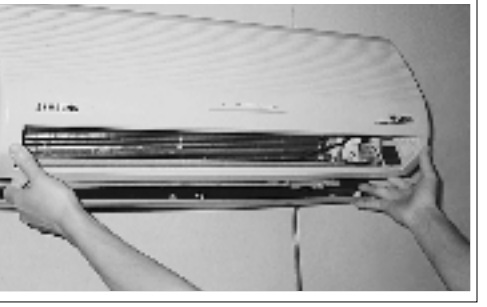
1. Carry out the pump down procedure (refer to the details of 'pump down').
2. Remove the power cord.
3. Disconnect the assembly cable from the indoor and outdoor units.
4. Remove the flare nut connecting the indoor unit and the pipe.
   At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
5. Disconnect the pipe connected to the outdoor unit.
   At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
6. Make sure you do not bend the connection pipes in the middle and store together with the cables.
7. Move the indoor and outdoor units to a new locatioon.
8. Remove the mounting plate for the indoor unit and move it to a new location.

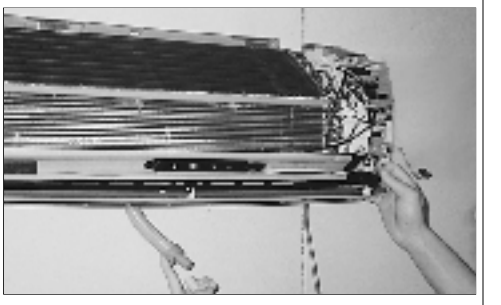
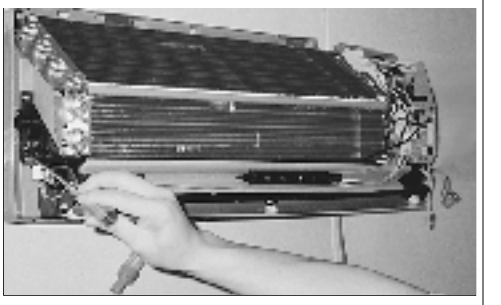
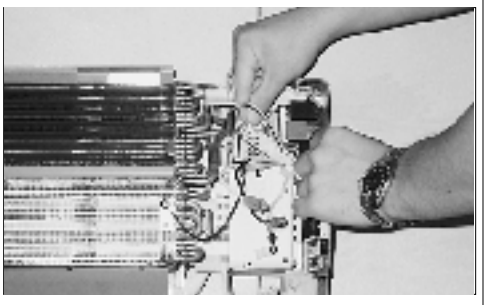
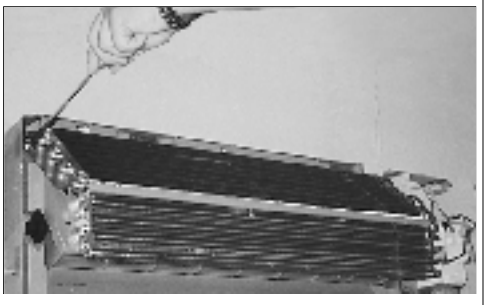
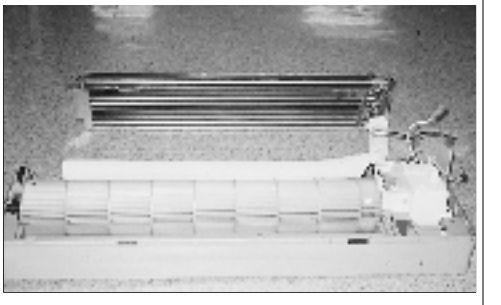
MEMO

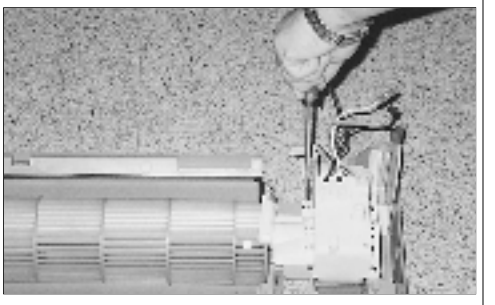
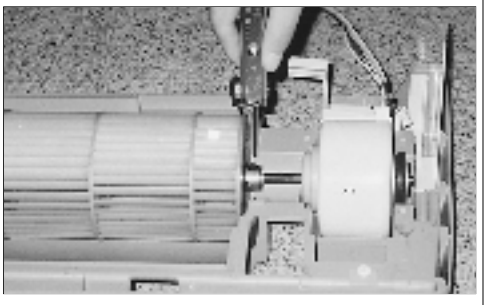
4. Disassembly and Reassembly

Stop operation of the air conditioner and remove the power cord before repairing the unit.

4-1 Indoor Unit

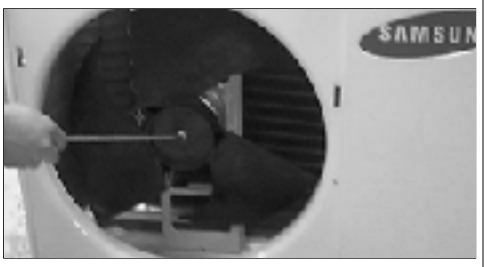
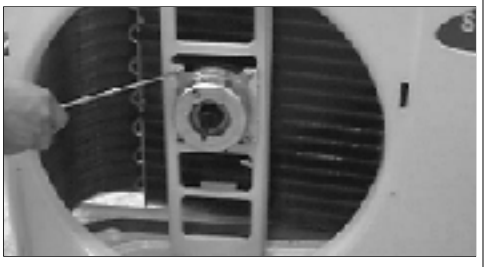
No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power. 2) Seperate tape of front panel upper.	
		3) Contract the second finger to the left, and right handle and pull to open the inlet grille. 4) Take the left and right filter out. * Take the Deadorizing and Electrostatic filter out. (OPTION models)	
		5) Loosen one of the right fixing screw and seperate the terminal cover. 6) Loosen three fixing screws of front grille.	
		7) Pull the upper left and right of discharge softly for the outside cover to be pulled out.	
		8) Pull softly the lower part of discharge and push it up. **Caution;** Assemble the front panel and fix the hooks of left and right.	

No	Parts	Procedure	Remark
2	Ass'y Tray Drain.	1) Do "1", above. Separate the drain hose from the extension drain hose. 2) Take the display PCB out. (Center of indoor unit) 3) Loosen three fixing screws of left and right 4)Pull tray drain out from the back body.	 
3	Electrical Parts (Main PCB)	1) Do "1", "2", above 2) Take all the connector of PCB upper side out. (Inclusion Power cord) 3) Separate the outdoor unit connection wire from the terminal block. 4) If pulling the Main PCB up. it will be taken out. (Separate the TRANS hook. it before).	
4	Heat Exchanger	1) Do "1" and "2", "3", above 2) Loosen two fixing earth screws of right side. 3) Separate the connection pipe. 4) Separate the bush body at the upper side and holder at the rearside. 5) Loosen the two fixing screws of left side. 6) Lifting the heat exchanger up a little to push the up side for separation from the indoor unit.	 

No	Parts	Procedure	Remark
3	Fan Motor and Cross Fan	1) Do “1” “2” ”3” “4”, above. 2) Loosen the fixing three screws and separate the motor holder. 3) Loosen the fixing screw of fan motor. (By use of M3 wrench) 4) Separate the fan motor from the fan. 5)Separate the fan from the left holder bearing.	 

4-2 Outdoor Unit

No	Parts	Procedure	Remark
1	Common Work	1) Loosen the fixing screw and separate the cover E-parts. 2) Separate the connection wire from the terminal block.	
		3) Loosen three fixing screws and separate the upper cabinet.	
		4) Loosen the two fixing screws of Ass'y E-part.	
		5) Loosen seven fixing screws and separate the side cabinet.	
2	Fan and Motor	1) Do “1”, above. 2) Loosen two fixing screw, of the front cabinet. 3) Push the brackets of the outer cover to separate the protection mesh from the rear side of front cabinet.	

No	Parts	Procedure	Remark
		4) Remove the nut flange (Turn to the right to remove, as it is a left hand screw) 5) Separate the fan. 6) Loosen four fixing screws to separate the motor.	 
3	Heat Exchanger	1) Do “1”, above. 2) Loosen three fixing screws of left and right side. 3) Disassemble the inlet and outlet pipe by welding. 4) Separate the heat exchanger.	
4	Compressor	1) Do “1”, above. 2) Open the terminal cover of compressor and unscrew the connection terminal. 3) Disassemble the inlet and outlet pipe of compressor by welding. 4) Disassemble the inlet and outlet pipe of condenser by welding 5) Loosen the three bolts of the lower part. 6) separate the compressor.	

MEMO

5. Troubleshooting

5-1 Items to be checked first

1) Is the voltage of the power correct?
The input voltage shall be 198-264VAC.
The airconditioner may not operate properly if the voltage is out of this range.

2) Is the link cable linking the indoor unit and the outdoor unit linked properly?
The indoor unit and the outdoor unit shall be linked by 3 cables.
Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
Otherwise the airconditioner may not operate properly.

3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

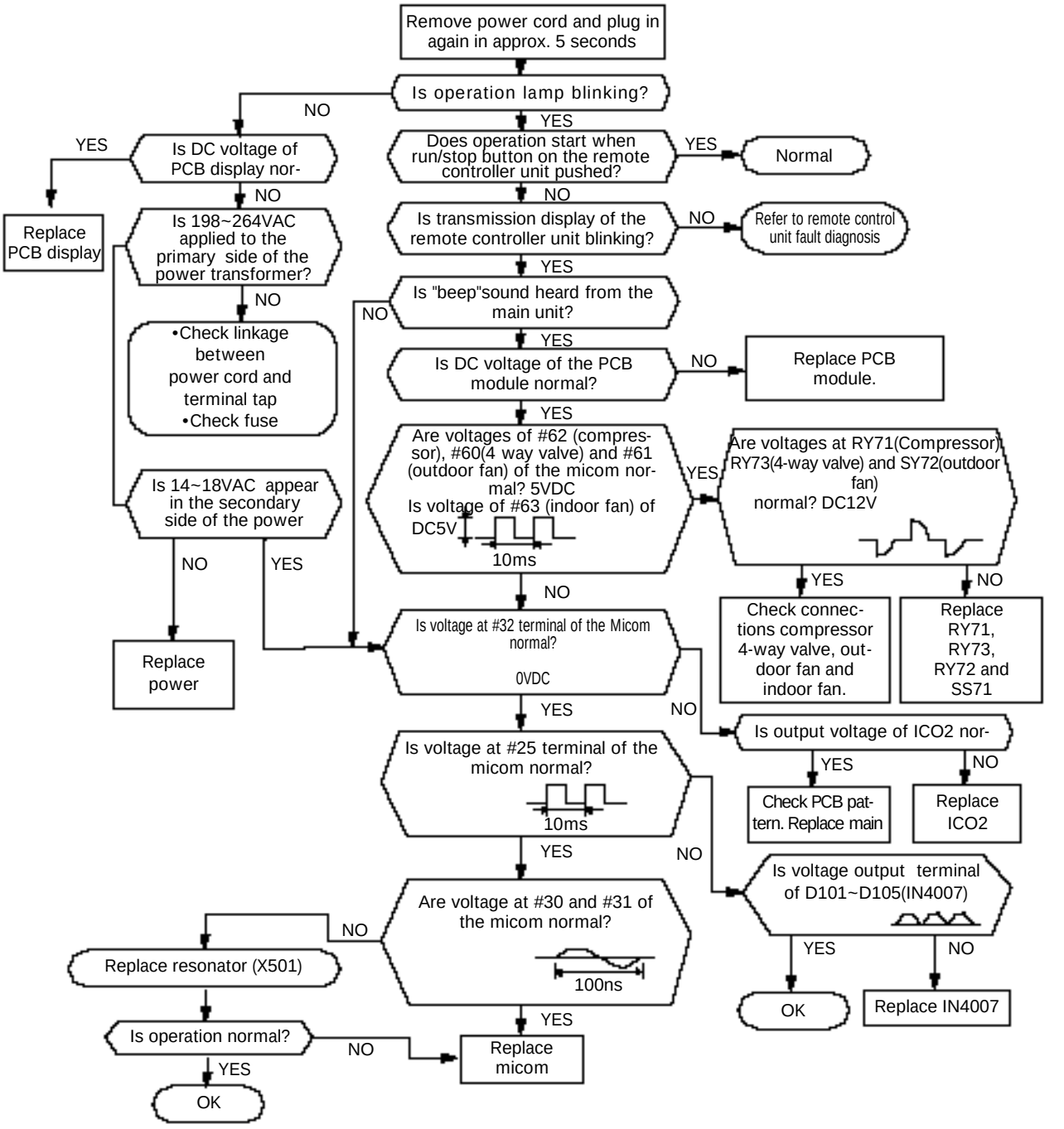
NO	Operation of air conditioner	Explanation
1	The COOL operation indication LED (Green) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the IN DOOR FAN should operate. In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is 5 steps is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Timer LED only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
6	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

NO	Display	Self Diagnosis
1	Operating LED blinking (1Hz)	Restore from power failure (input initial power)
2	TIMER LED blinking (1Hz)	Indoor unit Room sensor Error (open or short)
3	OPERATING and TIMER LED blinking (1Hz)	Indoor unit heat exchanger temperature sensor Error (open or short)
4	FAN LEA blinking (1Hz)	Indoor fan malfunctioning (for spead is Below 38Orpm)

5-2-1 No Power (completely dead)-Initial diagnosis

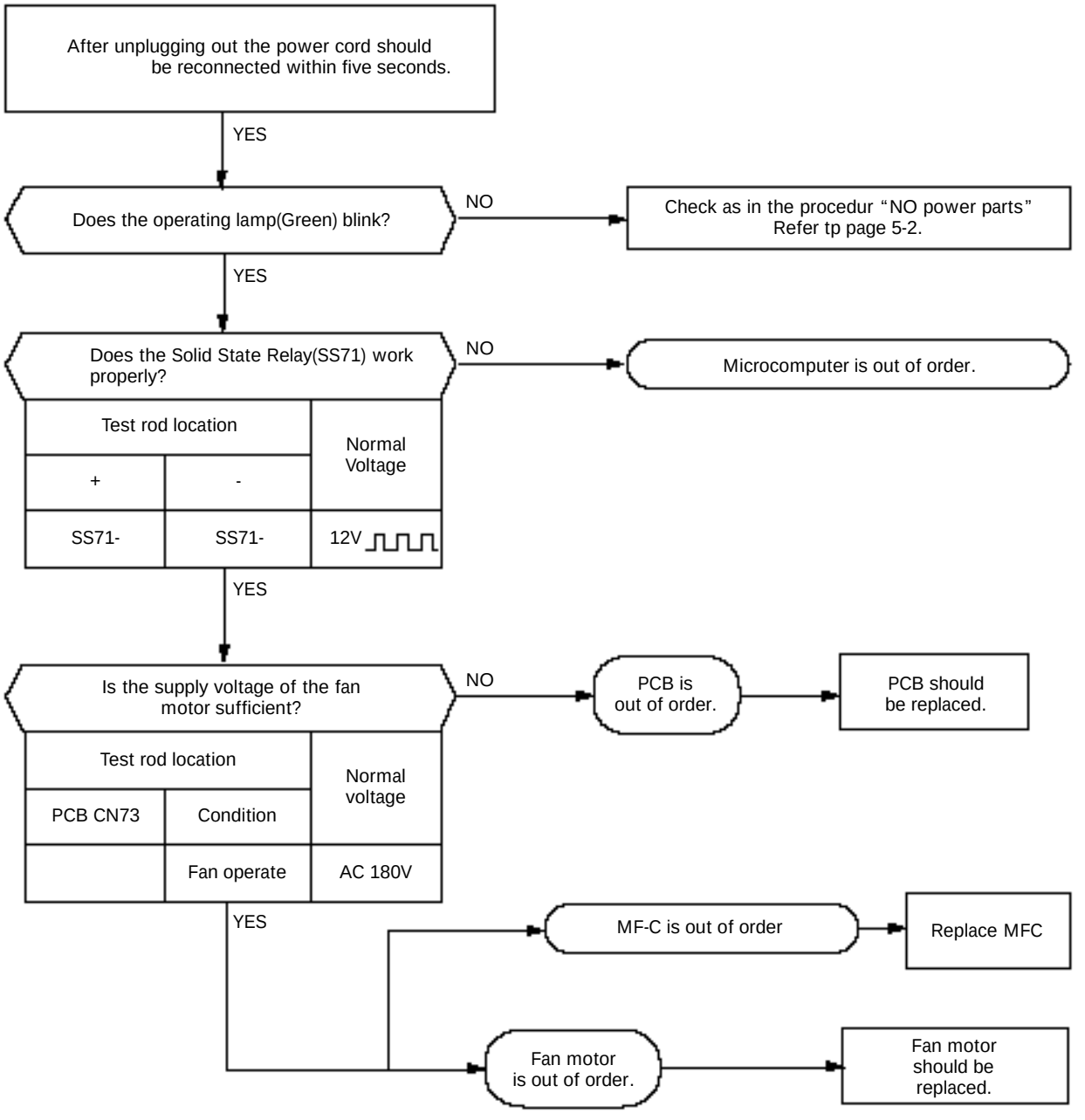
1) Checklist :
   (1) Is input voltage normal? (198-264V~)
   (2) Is AC power linked correctly?
   (3) Are connections between primary side, secondary side of the power transformer and PCB good.
   (4) Is output voltage of DC regulator IC KA7812 (IC01) normal? (11VDC-12.5VDC)
   (5) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)



5-2-2 When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is the indoor unit fan motor properly connected with the connector (CN73)?
   (2) Is the AC voltage correct?
   (3) Is HALL IC in indoor fan motor properly connected with the connector (CN43)?
   (4) Is the running capacitor properly connected with the terminal?

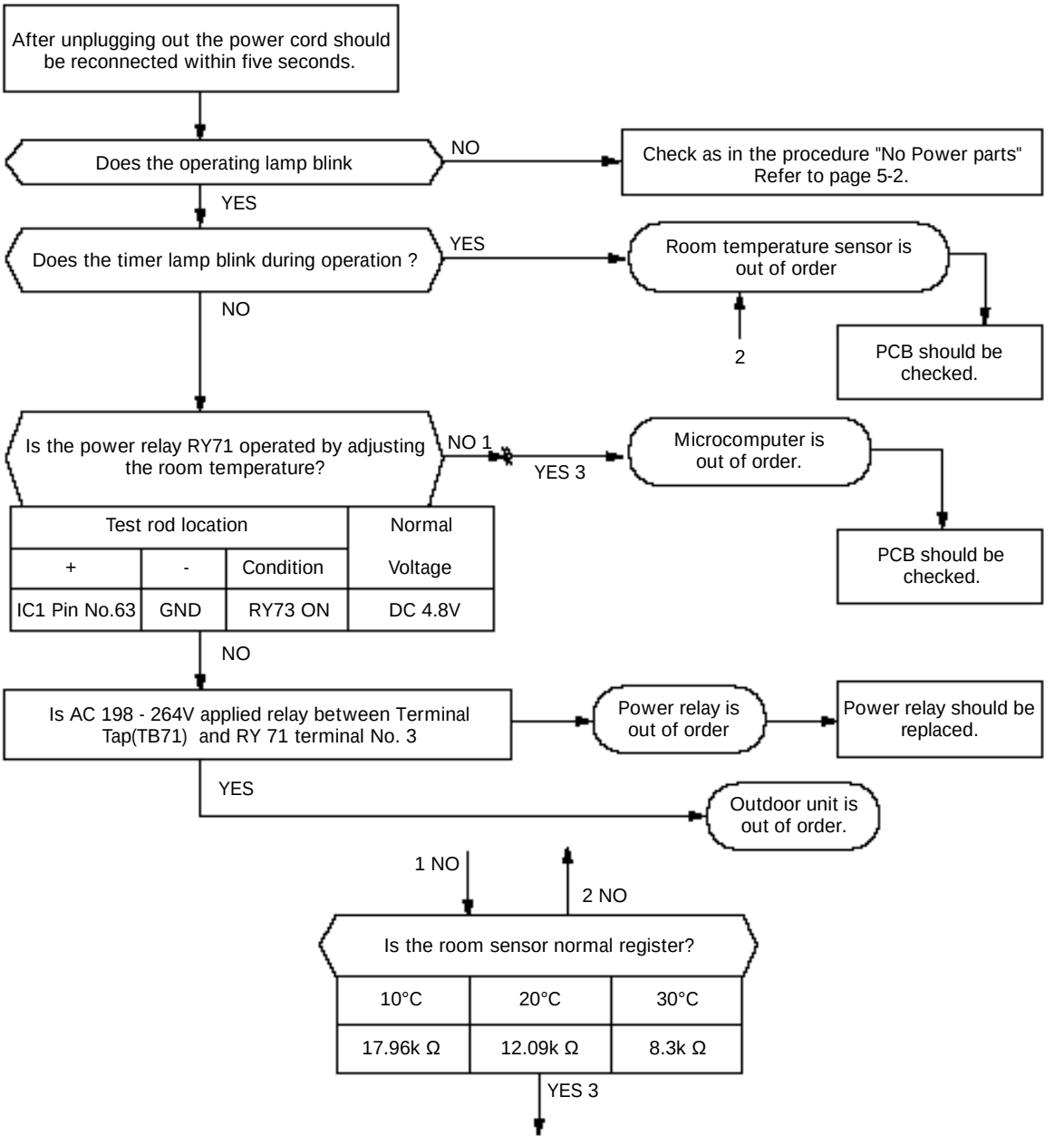
2) Troubleshooting procedure



5-2-3 When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is input voltage normal?(198-264V~)
   (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
   (3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
   (4) Is the POWER IN connector (terminal-tab) linked correctly?
   (5) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(5P)?

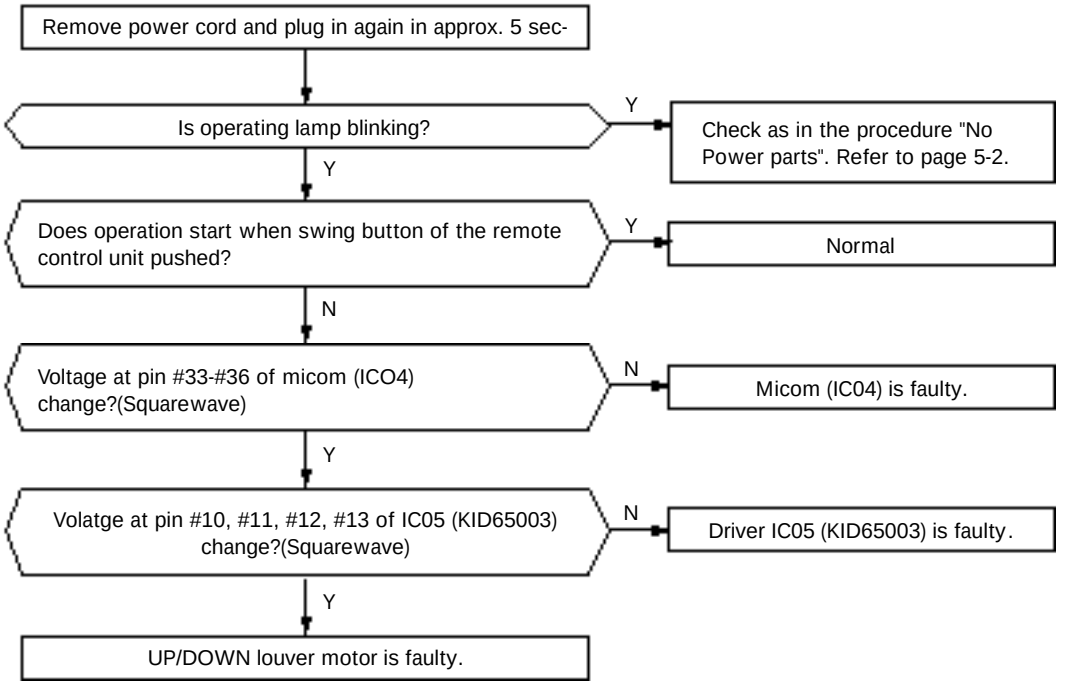
2) Troubleshooting procedure



5-2-4 When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

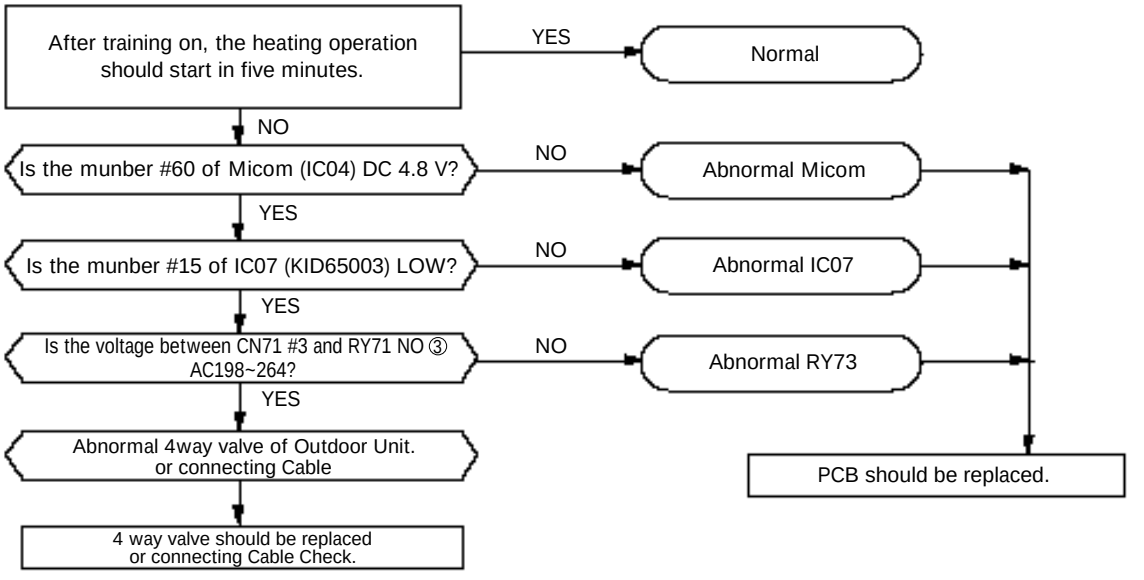
1) Checklist :
   (1) Is input voltage normal? (198-264V~)
   (2) Is the UP / DOWN louver motor properly connected with the connector (CN61)?

2) Troubleshooting procedure


Remove power cord and plug in again in approx. 5 sec-
Is operating lamp blinking?
Y
Check as in the procedure "No Power parts". Refer to page 5-2.
Y
Does operation start when swing button of the remote control unit pushed?
Y
Normal
N
Voltage at pin #33-#36 of micom (ICO4) change?(Squarewave)
N
Micom (IC04) is faulty.
Y
Volatge at pin #10, #11, #12, #13 of IC05 (KID65003) change?(Squarewave)
N
Driver IC05 (KID65003) is faulty.
Y
UP/DOWN louver motor is faulty.

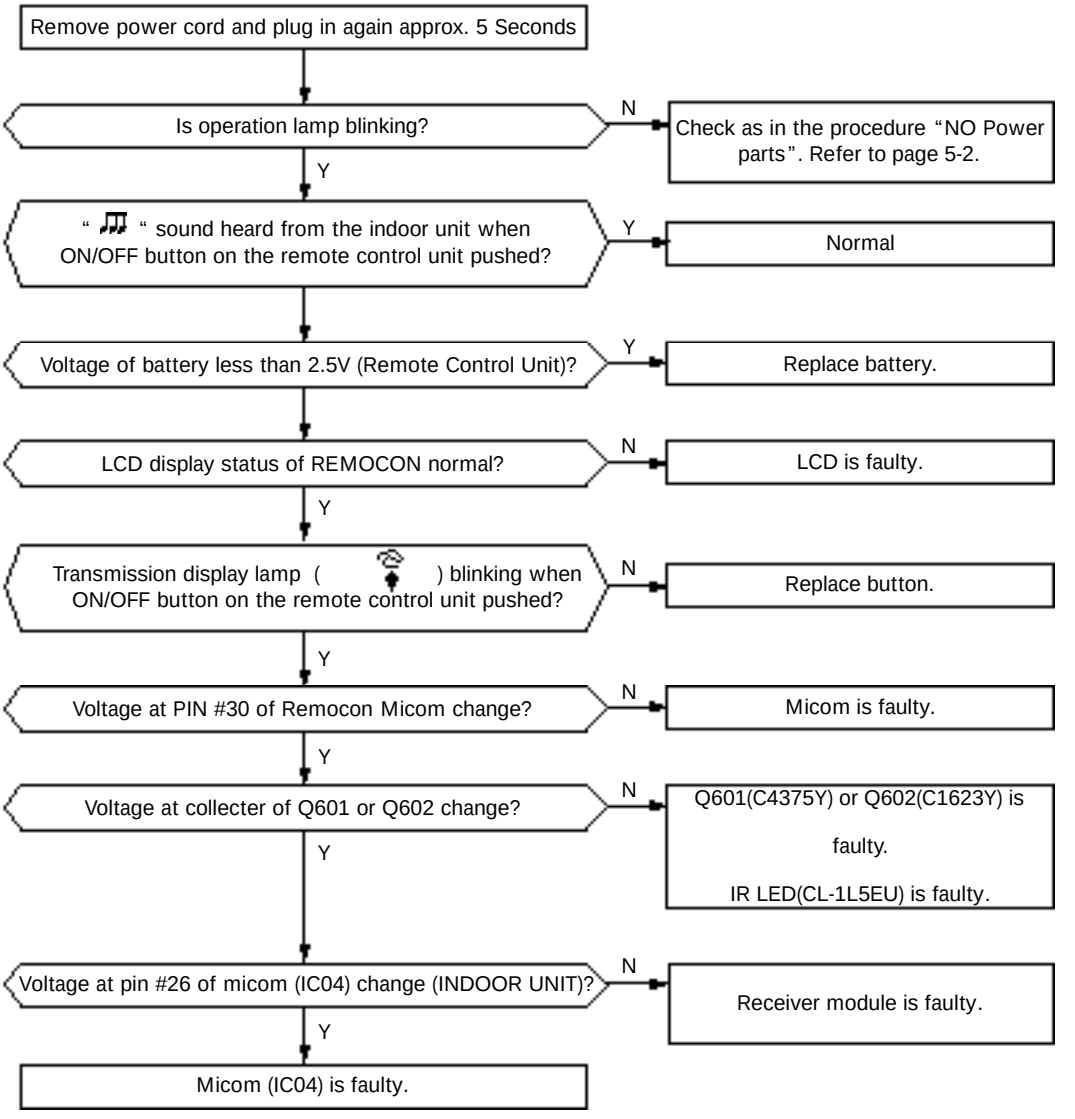
5-2-5 In the mode, When there is no warm air current. Check this first;

(1) Is the set temperature of Remote Control lower than room temperature in Heat mode?
(2) Is the Indoor PCB properly connected with the CN71 connector?


After training on, the heating operation should start in five minutes.
YES
Normal
NO
Is the munber #60 of Micom (IC04) DC 4.8 V?
NO
Abnormal Micom
YES
Is the munber #15 of IC07 (KID65003) LOW?
NO
Abnormal IC07
YES
Is the voltage between CN71 #3 and RY71 NO ③ AC198~264?
NO
Abnormal RY73
YES
Abnormal 4way valve of Outdoor Unit. or connecting Cable
4 way valve should be replaced or connecting Cable Check.
PCB should be replaced.

5-2-6 If Operation By Remote Control Unit Is Impossible. (Initial Diagnosis)

1) Troubleshooting procedure


Remove power cord and plug in again approx. 5 Seconds
Is operation lamp blinking?
N
Check as in the procedure "NO Power parts". Refer to page 5-2.
Y
" ♫ " sound heard from the indoor unit when ON/OFF button on the remote control unit pushed?
Y
Normal
Voltage of battery less than 2.5V (Remote Control Unit)?
Y
Replace battery.
LCD display status of REMOCON normal?
N
LCD is faulty.
Y
Transmission display lamp ( ) blinking when ON/OFF button on the remote control unit pushed?
N
Replace button.
Y
Voltage at PIN #30 of Remocon Micom change?
N
Micom is faulty.
Y
Voltage at collecter of Q601 or Q602 change?
N
Q601(C4375Y) or Q602(C1623Y) is faulty.
IR LED(CL-1L5EU) is faulty.
Y
Voltage at pin #26 of micom (IC04) change (INDOOR UNIT)?
N
Receiver module is faulty.
Y
Micom (IC04) is faulty.

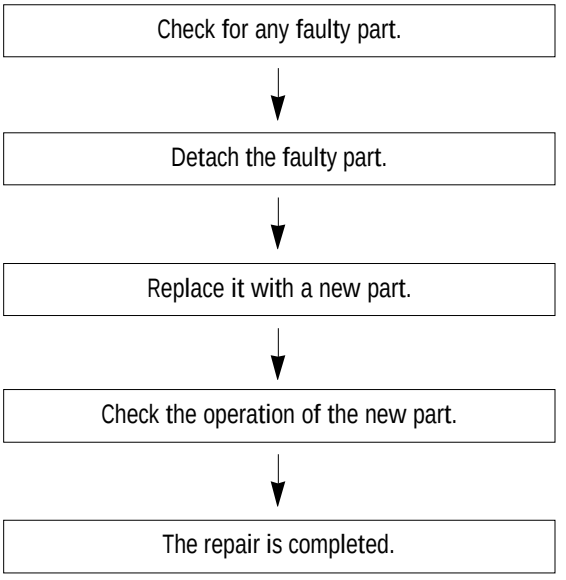
5-3 PCB Inspection

5-3-1 Cautions for Part Replacement

1. The human body carries much static electricity. Before touching a part for repair, replacement or the similar purpose, be sure to touch a grounded metallic portion by hand to let the static electricity go through the matallic portion to the earth. Especially when handling any micro computer or IC, carefully remove such static electricity before touching them.
2. When repairing any part on a work bench, be sure to place an insulative sheet on the bench and always keep the sheet surface neat without any metal fragments. If any such fragment touches a part, a secondary trouble will possibly be caused in the part.
3. Before replacing any parts, be sure to turn off the power supply. If such replacement is done with the power supply kept on, an electric shock, short circuit or destruction of a part may result.
4. During replacement or repair of a part, carefully handle it : The printed circuit board has fine lead wires (jumper wires) and glass-made parts (diode) on its substrate. So if a circuit board is roughly handled, such lead wires and parts will be easily broken or damaged by bending or shock.
5. When soldering the lead wires of any new part, be sure to polish them using an emery paper or the like before solding them. Since the lead wires of any new part are covered with an oxide film, solder cannot adhere to the lead wires if not polished.
6. When soldering any part, care should be exercised not to apply any high-wattage soldering iron to the part for a long time. Some parts are of so low a heat resistance that they may be broken or have the properties changed if a soldering iron is so applied (Otherwise, the pattern may possibly be separated and raised).
7. The heat of the soldering iron should be transfered to the entire object to be soldered. If the solder pieces are not well fused due to insufficient transfer of the heat from the soldering iron, no satisfactory electrical continuity can be assured even if the soldered objects appear well connected to each other.
8. The solder used should be limited to a minimum. If excessive solder is used, it will cause inter-pattern contact, which may cause malfunction of the circuit.

5-3-2 Procedure

The parts should be replaced in the following procedure.


Check for any faulty part.
Detach the faulty part.
Replace it with a new part.
Check the operation of the new part.
The repair is completed.

5-3-3 Detailed Procedure

No.	Malfunction	Checking point (symptoms)	Causes
1	Pull out the power plug from the AC terminal and confirm the fuse on the PCB assembly	1. Is the broken?	1. Voltage over 2. Indoor unit fan motor short-circuit.
2	Turn the power on. If lamp blinks trouble is not related to the items 1 through 4 on the right.	Voltage check	
		1. AC voltage at both end of transformer Primary? 198 - 264V~	1. Irregular power code or power fuse, or poor wiring.
		2. AC voltage at both end of transformer secondary? 14- 18Vac	2. Transformer is faulty.
		3. DC voltage at OUT and GND of IC01 (KA7812)? 12VDC	3. Power circuit is faulty.
		4. DC voltage at OUT and GND of IC02? 5VDC	4. Power circuit is faulty.
		5. DC voltage at Q201 Base and GND change? squarewave	5. Q201 is faulty. D101~D104 (IN4007)
3	Set operating mode when RMC switch pushed. Except for [FAN]mode and [TIMER] mode.	Voltage check	
		1. Voltage of relay (RY71) coil Voltage at pin#10, pin#7 of IC07 : 12VDC	1. Relay(RY 71) coil is open. IC6(ULN2003) is faulty.
		2. Voltage at Terminal Tap (TB71 or 72) and RY71 Terminal N0④. 198- 264V~	2. Relay(RY 71) contactor is faulty.
4	Set operating mode when RMC switch pushed. 1. COOL mode 2. Fan speed [AUTO] 3. Set temperature lower than room temperature 4. Continuously operation.	1. Compressor does not operate.	1. Temperature of Heat exchange is lower. 2. PCB is faulty. 3. Room sensor or Heat exchanger temperature sensor is faulty
5	Set operating mode when RMC switch pushed. 1. [FAN] mode 2. Fan speed [Hi] 3. Continuously operation	1. Voltage at ③⑤ both ends of CN73 : above 180V~ 2. Indoor unit fan motor does not operate.	1. Indoor unit fan motor is faulty. 2. Poor connection of indoor fan motor and connector of RPM sensing (CN43)

5-4 Fault Diagnosis of Major Parts

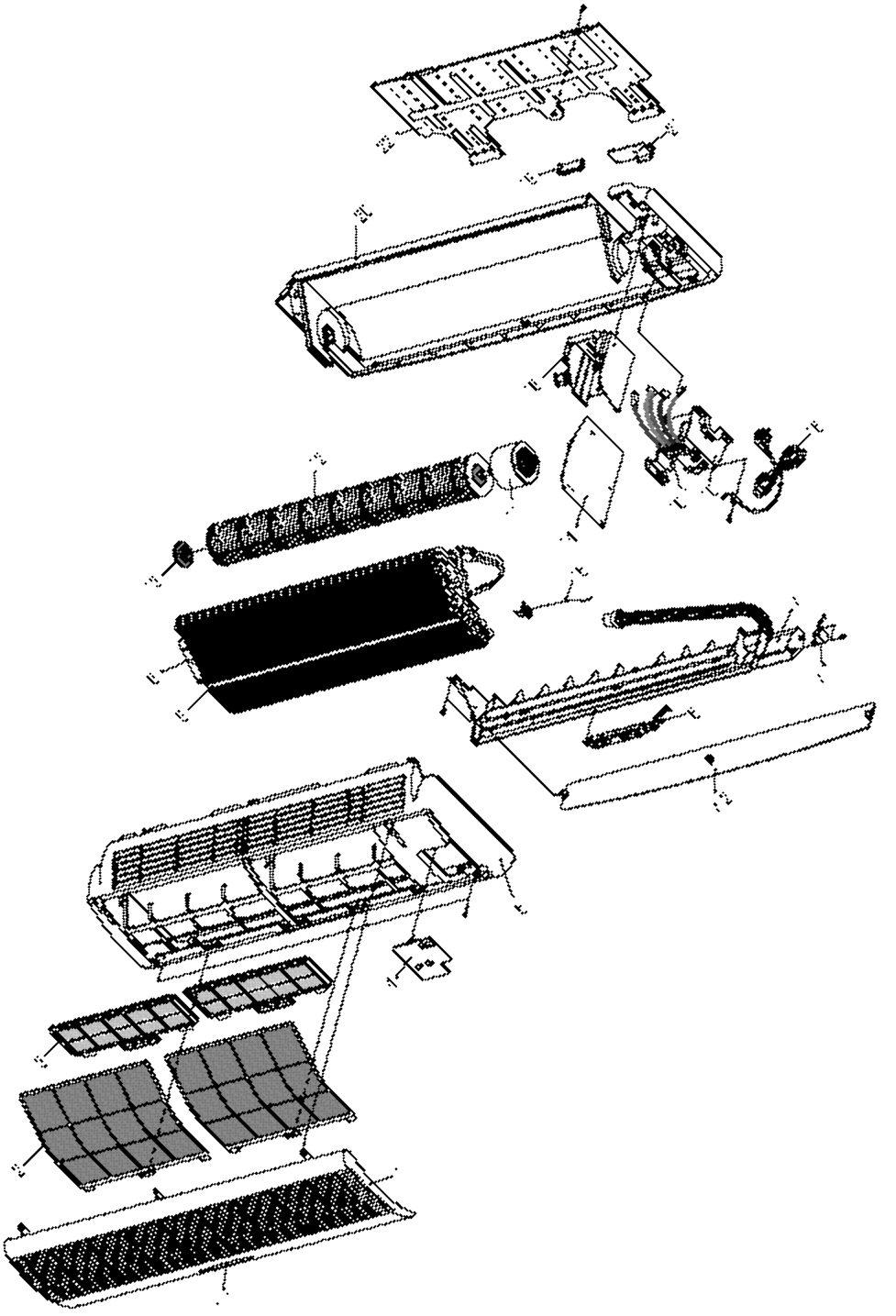
<table>
<tr><th>Parts</th><th colspan="2">Diagnosis</th></tr>
<tr><td rowspan="11">Temp.Sensor

Heat ex. Sensor

Indoor Fan Motor

6. Exploded Views and Parts List

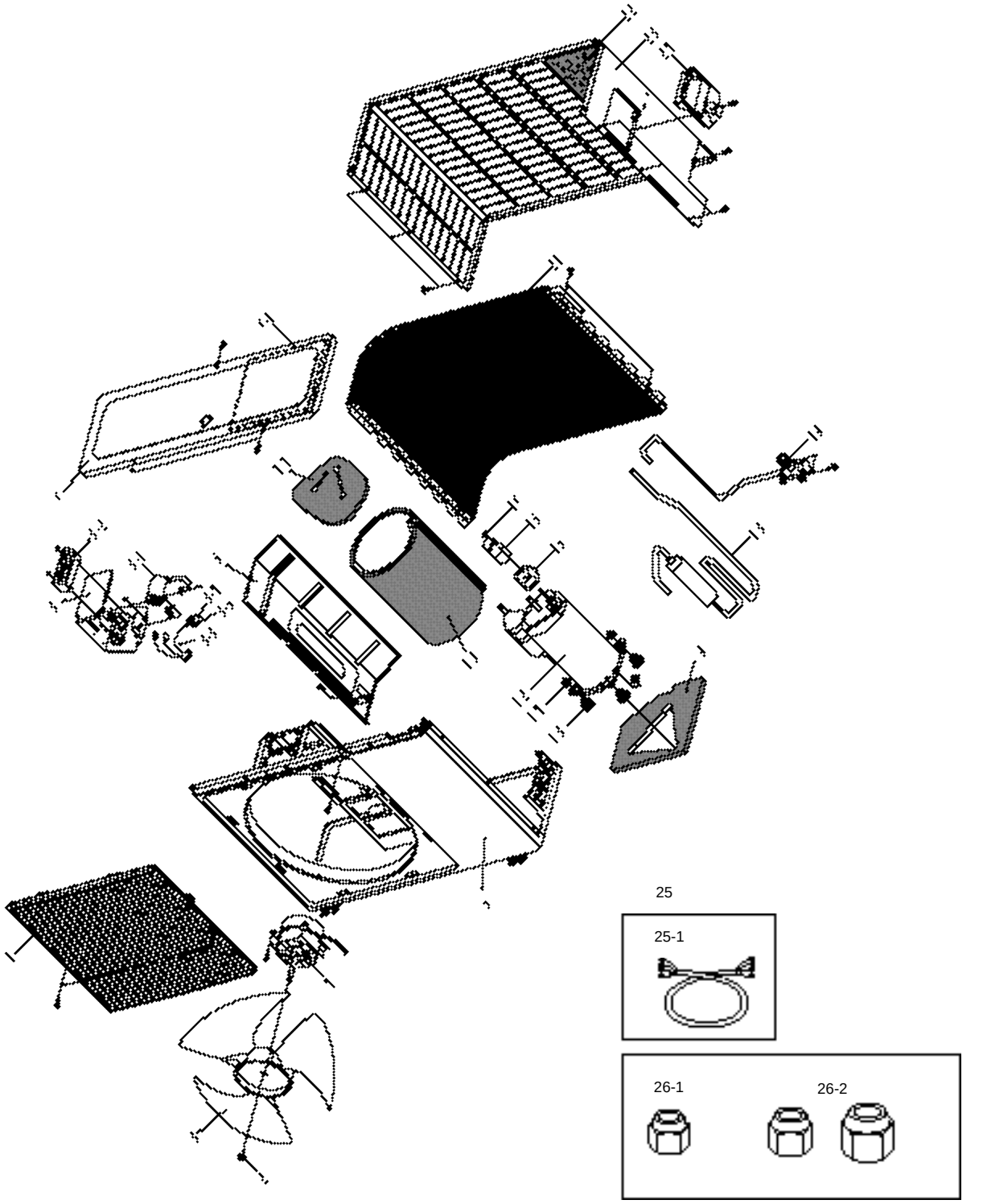
6-1 Indoor Unit



■ Parts List

No.	CODE NO	Description	Specification	Q'TY					Remark
				AS07A1VE	AS09A1VE	AS09A1VB	AS12A1VE	AS12A1VB	
1	DB64-10140A	GRILLE AIR INLET	ABS	1	1	1	1	1	
	DB64-10143A	GRILLE AIR INLET	ABS	-	-	-	-	-	
1-1	DB64-70073A	PANEL CENTER DISPLAY	PC	1	1	1	1	1	
	DB64-70106A	PANEL CENTER DISPLAY	PC	-	-	-	-	-	
2	DB63-30131A	GUARD AIR FILTER	PP	2	2	2	2	2	
3	DB74-10091A	ASS´Y FILTER	CLEANER/CARBON	-	-	-	-	-	
4	DB63-10427B	COVER TERMINAL	HIPS	1	1	1	1	1	
5	DB92-70075E	ASS´Y FRONT PANEL	ASS´Y	1	1	1	1	1	
	DB92-70081A	ASS´Y FRONT PANEL	ASS´Y	-	-	-	-	-	
6	DB93-10560A	ASS´Y PCB DISPLAY	ASS´Y	1	1	1	1	1	
7	DB94-10088A	ASS´Y TRAY DRAIN	ASS´Y	1	1	-	1	-	
7-1	DB95-20138A	ASS´Y STEP MOTOR U/D	DC12V.600GR	1	1	1	1	1	⚠
7-2	DB66-30153A	BLADE-H	HIPS	1	1	1	1	1	
8	DB75-40072A	ASS´Y EVAP	ASS´Y	-	-	1	1	1	
	DB75-40093A	ASS´Y EVAP	ASS´Y	-	-	-	-	-	
	DB75-40074A	ASS´Y EVAP	ASS´Y	-	-	-	-	1	
	DB75-40094A	ASS´Y EVAP	ASS´Y	-	-	-	-	-	
	DB75-40076A	ASS´Y EVAP	ASS´Y	1	1	1	-	-	
9	DB67-30058C	SPACER EVAP	PVC	1	1	-	1	-	
10	DB61-40250D	ASS´Y HOLDER MOTOR	ASS´Y	1	1	1	1	1	
10-1	DB65-40052A	ASS´Y TERMINAL BLOCK	ASS´Y	1	1	1	1	1	
11	DB31-10078H	MOTOR FAN IN	AMPFS040WTVB	1	1	1	1	1	⚠
12	DB94-30141A	ASS´Y-C-F-FAN	Ø95 X 619.4mm	1	-	1	1	1	
13	DB94-40017A	ASS´Y BEARING	ASS´Y	1	1	1	1	1	
14	DB93-10482A	ASS´Y MAIN PCB	ASS´Y	-	-	-	1	-	⚠
	DB93-10486A	"	ASS´Y	-	1	-	-	1	⚠
	DB93-10484A	"	ASS´Y	1		-	-		⚠
	DB93-10615A	"	ASS´Y	-	-	-	-	1	
	DB93-10616A	"	ASS´Y	-	-	1	-	-	
15	DB32-10008D	ASS´Y-THERMISTOR	ASS´Y	1	1	1	1	1	
16	DB39-10062V	ASS´Y POWER CORD	UCP2	1	1	1	1	1	⚠
17	DB61-10151A	CASE CONTROL	ABS	1	1	1	1	1	⚠
18	DB61-60093A	BODY-BUSH	HIPS	1	1	1	1	1	
19	DB94-20030C	ASS´Y BACK BODY	ASS´Y	1	1	1	1	1	
20	DB61-40247A	HOLDER PIPE	HIPS	1	1	1	1	1	
21	DB70-10618A	PLATE HANGER	SGCC-M	1	1	1	1	1	

6-2 Outdoor Unit

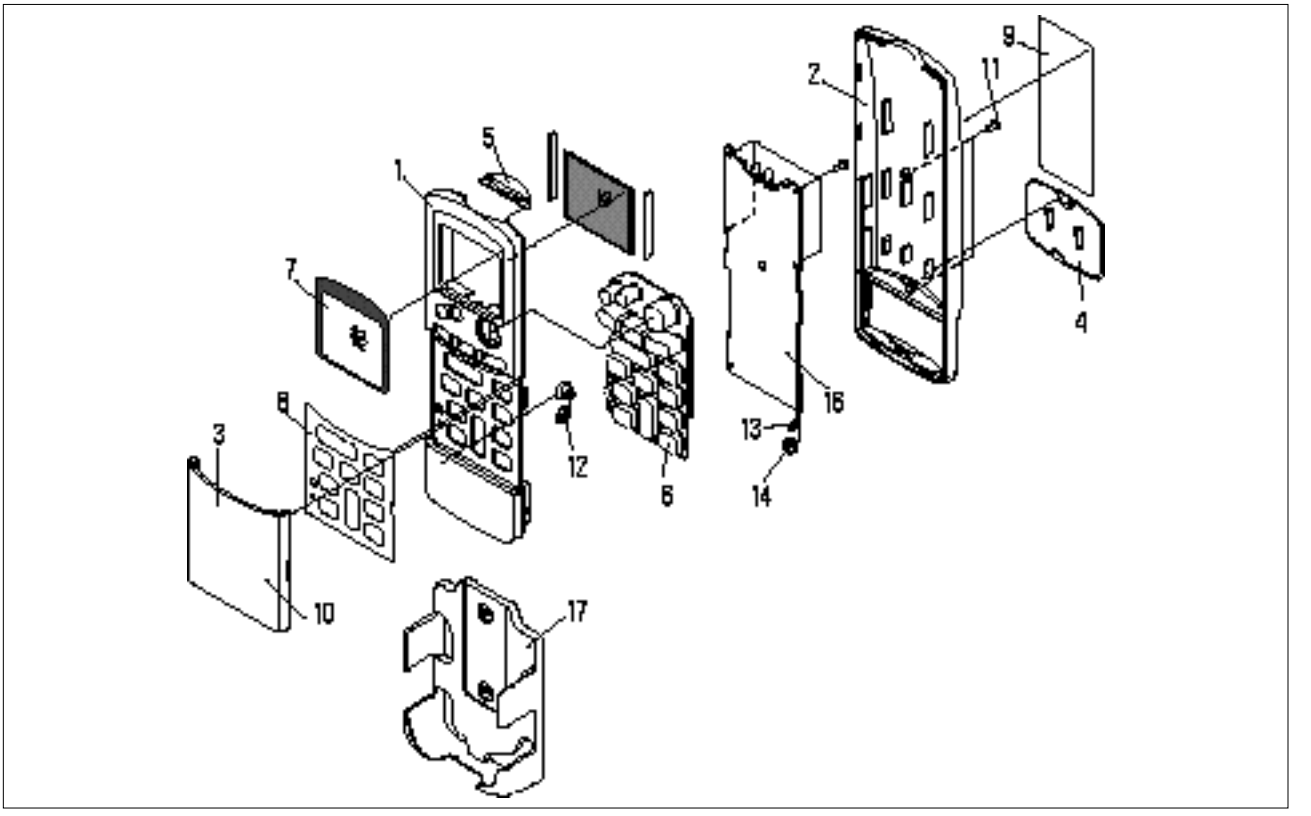


■ Parts List

No.	CODE NO	Description	Specification	Q'TY					Remark
				US07A1VE	US09A1VE	US09A1VB	US12A1VE	US12A1VB	
1	DB63-30004A	GUARD FAN	ABS	1	1	-	1	-	
	DB63-30004B	GUARD FAN	ABS			1		1	
2	DB60-30004A	NUT FLANGE	2C SM20C M6 NTR	1	1	1	1	1	
3	DB67-50063A	PROPELLER-FAN	AS+G/F Ø405	1	1	1	1	1	
4	DB31-10058C	MOTOR FAN OUT	AMASS020WTVA	-	-	-	1	1	⚠
	DB31-10140B	„	AMASS015WTVA	1	1	1	-	-	⚠
5	DB90-50009M	ASS´Y FRAME	ASS´Y	-	-	-	1	1	
	DB90-50009N	„	ASS´Y	1	1	1	-	-	
6	DB94-50032C	ASS´Y PARTITION	ASS´Y	-	-	-	1	1	
	DB94-50032D	„	ASS´Y	1	1	1	-	-	
7	DB64-60138A	CABINET UPPER	SECC-P	1	1	1	1	1	
7-1	DB72-50560B	INSU CABI UPPER	FOAM-PE+FOAM-PU	1	1	1	1	1	
8	DB91-20076A	ASS´Y-E PARTS.	ASS´Y	-	-	-	1	-	⚠
	DB91-20076B	„	ASS´Y	-	-	-	-	-	⚠
	DB91-20076C	„	ASS´Y	-	1	-	-	-	⚠
	DB91-20076D	„	ASS´Y	-	-	-	-	-	⚠
	DB91-20076E	„	ASS´Y	1	-	-	-	-	⚠
	DB91-20076F	„	ASS´Y	-	-	-	-	-	
	DB91-20093B	„	ASS´Y			1		-	
	DB91-20093A	„	ASS´Y			-		1	
8-1	2501-001100	CAPACITOR	0.9/30µF 450VAC	-	-	-	1	-	
	2501-001122	„	1.5/30µF 450VAC	-	1	-	-	-	
	2501-001099	„	1.5/25µF 450VAC	1	-	-	-	1	
	2501-001145	„	1.2/30µF 450VAC	-	-	-	-	-	
	2501-001147	„	1.7/30µF 450VAC	-	-	-	-	-	
	2501-001146	„	1.7/20µF 450VAC	-	-	1	-	-	
8-2	DB65-40050A	TERMINAL BLOCK	4P	1	1	1	1	1	
8-3	DB93-50128A	COMP & MOTOR WIRE	ASS´Y	1	1	1	1	1	
8-4	DB47-20001Z	O.L.P.	MRA12030-12008	-	-	-	1	-	⚠
	DB47-20002B	„	MST24AMN-12008	1	1	-	-	-	⚠
	DB47-20001Y	„	MRA12037-12007	-	-	-	-	-	⚠
	DB47-20002A	„	MRA12032-12008	-	-	1		-	⚠
	DB47-20001G	„	MRA12002-9200	-	-	-	-	1	⚠
8-5	DB67-60020A	O.L.P SPRING	STS304	1	1	1	1	1	
9	DB72-50566A	CLOTH COMP BOTTOM	FELT	-	-	-	-	1	
	DB72-50558A	„	RUB+FELT	1	1	1	-	-	
10	DB72-50571A	CLOTH COMP SIDE	FELT	-	-	-	1	1	
	DB72-50559A	„	EVA+FO-PU	1	1	1	-	-	
11	DB72-50557A	CLOTH COMP UPPER	FELT	1	1	1	1	1	
12	DB95-10062Y	COMPRESSOR	48A124JV1E5	-	-	-	-	-	
	DB95-10065K	„	44A070JW1E1	1	-	-	-	-	⚠
	DB95-10065N	„	44B092JW1E6	-	1	-	-	-	⚠
	DB95-10065C	„	44B092IW1E6	-	-	1	-	-	⚠
	DB95-10062W	„	48A135IV1E5	-	-	-	-	1	⚠
13	DB73-10004A	GROMMET-ISOLATOR	EPDM	3	3	3	3	3	
14	DB60-30028A	NUT-WASHER	HEX 2C MB ZPC	3	3	3	3	3	
15	DB63-20002A	GASKET	EPDM	1	1	1	1	1	
16	DB60-30018A	NUT-FLANGE	M5. SM20C	1	1	1	1	1	
17	DB96-10573A	TUBE-DISCHARGE	ASS´Y	-	-	-	1	1	
18	DB62-31668A	„	ASS´Y	-	1	1	-	-	
	DB62-31669A	„	ASS´Y	1	-	-	-	-	
	DB62-31641B	TUBE-SUCTION	ASS'Y	-	-	-	1	1	
19	DB96-10579A	„	ASS´Y	-	1	1	-	-	
	DB96-10540A	„	ASS´Y	1	-	-	-	-	
	DB96-10532D	ASSY-CAPI TUBE	ASS´Y	-	-	-	1	-	
20	DB96-10532C		ASS'Y	-	1	-	-	-	
	DB96-10694B	ASS'Y-CAPI TUBE	ASS'Y	-	-	1	-	-	
	DB96-10694C	ASS'Y-CAPI TUBE	ASS'Y	-	-	-	-	1	
	DB96-10571B		ASS'Y	1	-	-	-	-	
	DB96-30181E	ASSY-COND	ASS'Y	-	-	-	1	1	
21	DB75-30078A		ASS'Y	1	1	1	-	-	
	DB72-50563A	INSUL CABI-SIDE	FOAMPE+FOAM PU	1	-1	1	1	1	
22	DB90-10024D	ASSY-CABI SIDE	SECC-P	1	1	1	1	1	
23	DB63-10443A	ASSY-COVER E, PARTS	ASS´Y	1	1	1	1	1	
24	DB96-60086E	ASSY-CABLE BOX	RUBBER	1	1	1	1	1	
25	DB96-60086F	„	VINYL	1	1	1	1	1	
	DB99-90033A	ASSY-FLARE NUT	1/4" + 1/2"	-	-	-	1	1	
26-1	DB99-90033B	„	1/4" + 3/8"	1	1	1	-	-	
	DB60-30010A	FLARE-NUT	1/4"	1	1	1	1	1	
26-2	DB60-30010B	„	3/8"	1	1	1	-	-	
	DB60-30010C	„	1/2"	-	-	-	1	1	

6-3 Remote Control & PCB Box

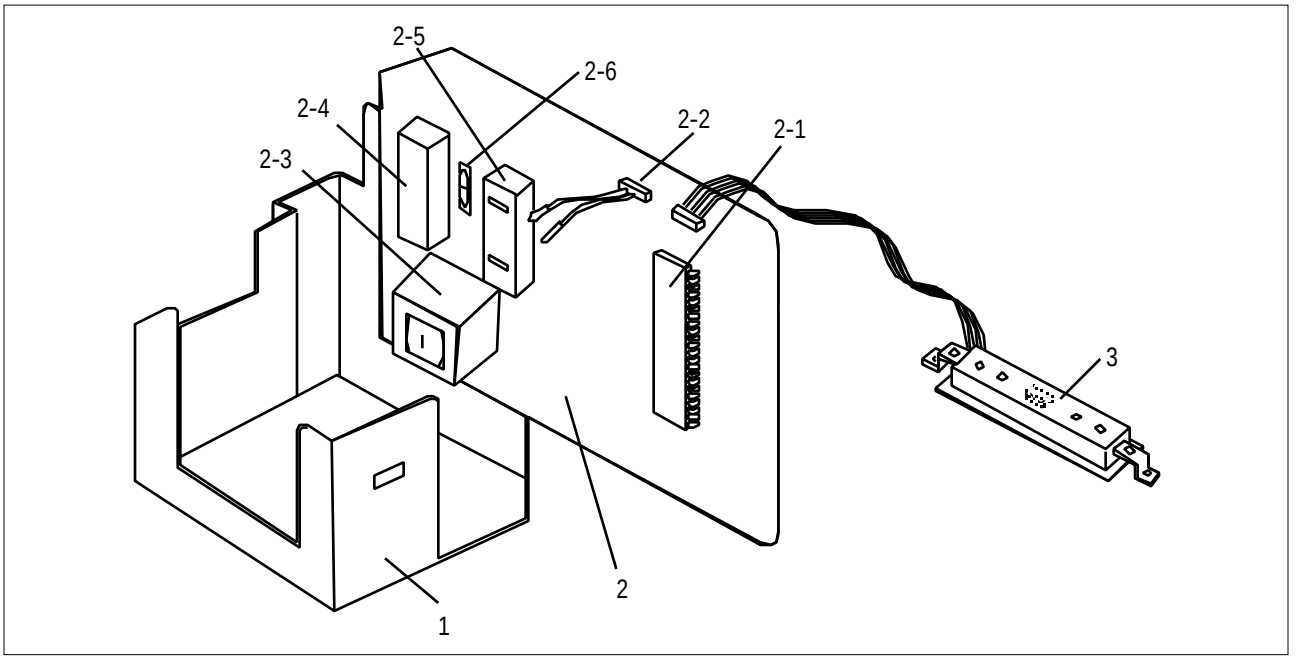
6-3-1 Remote Control



■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
	DB93-30052B	ASS'Y REMOCON			
1	DB61-10144A	CASE UP	ABS	1	
2	DB61-10145A	CASE LOW	ABS	1	
3	DB64-20054A	DOOR REMOCON	ABS	1	
4	DB63-10477A	COVER BATTERY	ABS	1	
5	DB74-10084A	FILTER REMOCON	PC	1	
6	DB73-20110B	RUBBER REMOCON	SILICON	1	
7		INLAY LCD	PC	1	
8	DB64-40166B	INLAY REMOCON	PC	1	
9	DB68-10775A	LABEL REMOCON	ART 90	1	
10	DB68-10777A	LABEL DOOR	ART 90	1	
11	PH-M2	SCREW TAP	PH-M2	6	
12	DB67-60061A	SPRING BATTERY	SUS 304	1	
13	DB67-60062A	SPRING BATTERY	SUS 304	1	
14	DB67-60063A	SPRING BATTERY	SUS 304	1	
15	90 x 250	PE BAG	90 x 250	1	
16	DB93-40179B	ASS'Y PCB REMOCON		1	
17	DB61-40243A	HOLDER REMOCON	ABS	1	

6-3-2 PCB Box



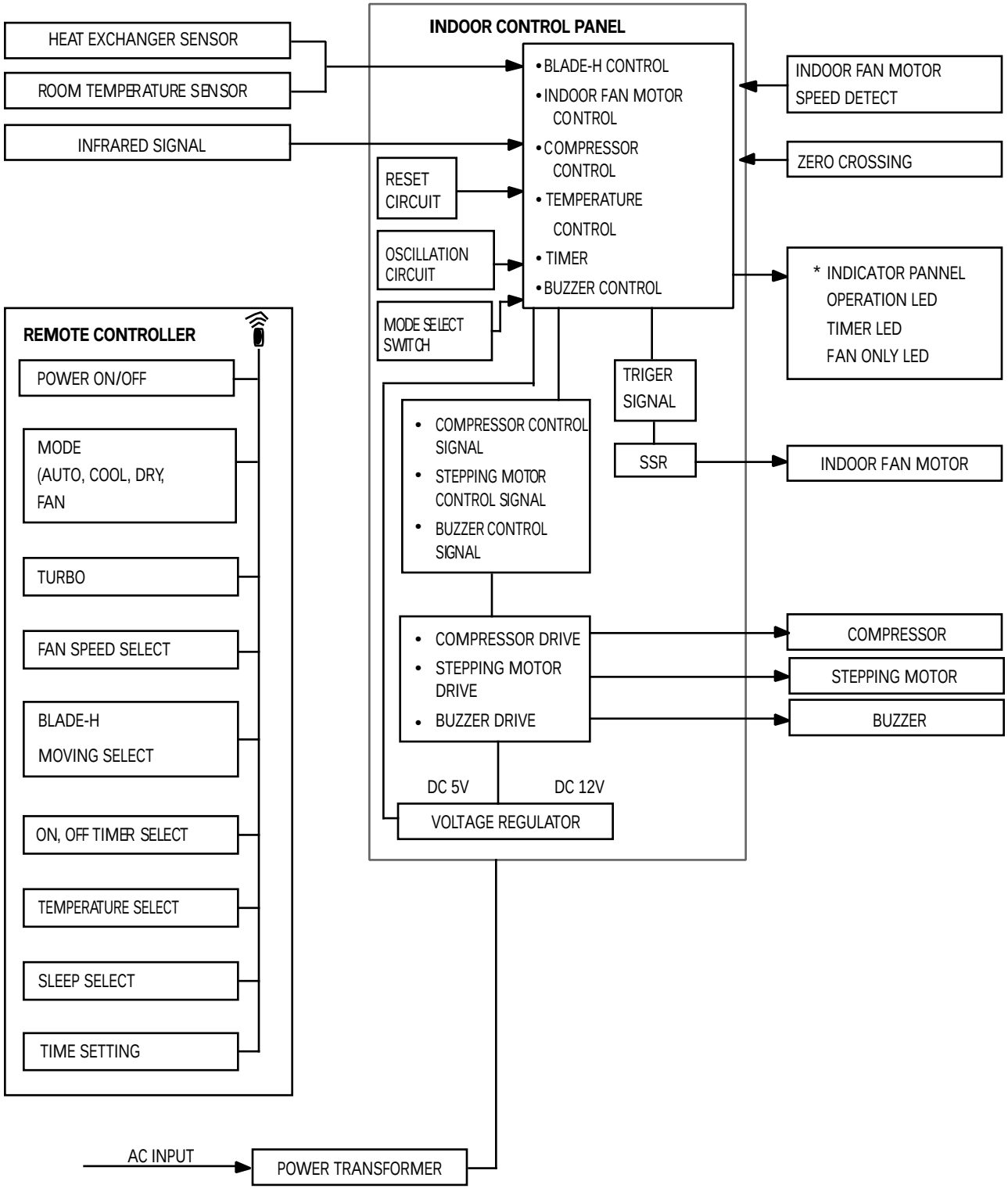
■ Parts List

No	CODE NO	Description	Specification	Q'TY					Remark
				AS07A1VE	AS09A1VE	AS12A1VE	AS09A1VB	AS12A1VB	
1	DB61-10136A	CASE-CONTROL		1	1	1	1	1	
2	DB93-10484A	Ass'y main PCB	-	1	-	-	-	-	
	DB93-10486A	Ass'y main PCB	-	-	1	-	-	-	
	DB93-10472A	Ass'y main PCB	-	-	-	1	-	-	
	DB93-10615A	"	-	-	-	-	-	1	
	DB93-10616A	"	-	-	-	-	1	-	
2-1	DB09-10149A	Micom	MB89635R-466	1	1	1	1	1	
2-2	DB32-10008D	Thermistor-EVAP	103AT 240/240	1	1	1	1	1	
2-3	DE26-20154A	Trans-power	AC230V DC17V 300mA	1	1	1	1	1	
2-4	2306-000294	C-film	CFS 99N 450VAC 155K	1	1	1	1	1	
2-5	3501-001058	Power-relay	DI1U DC12V	1	1	1	1	1	
2-6	DE32-10037A	Fuse	250V 3.15A	1	1	1	1	1	
3	DB93-10560A	Ass'y-display and Remocon Module	EDGE	1	1	1	1	1	

MEMO

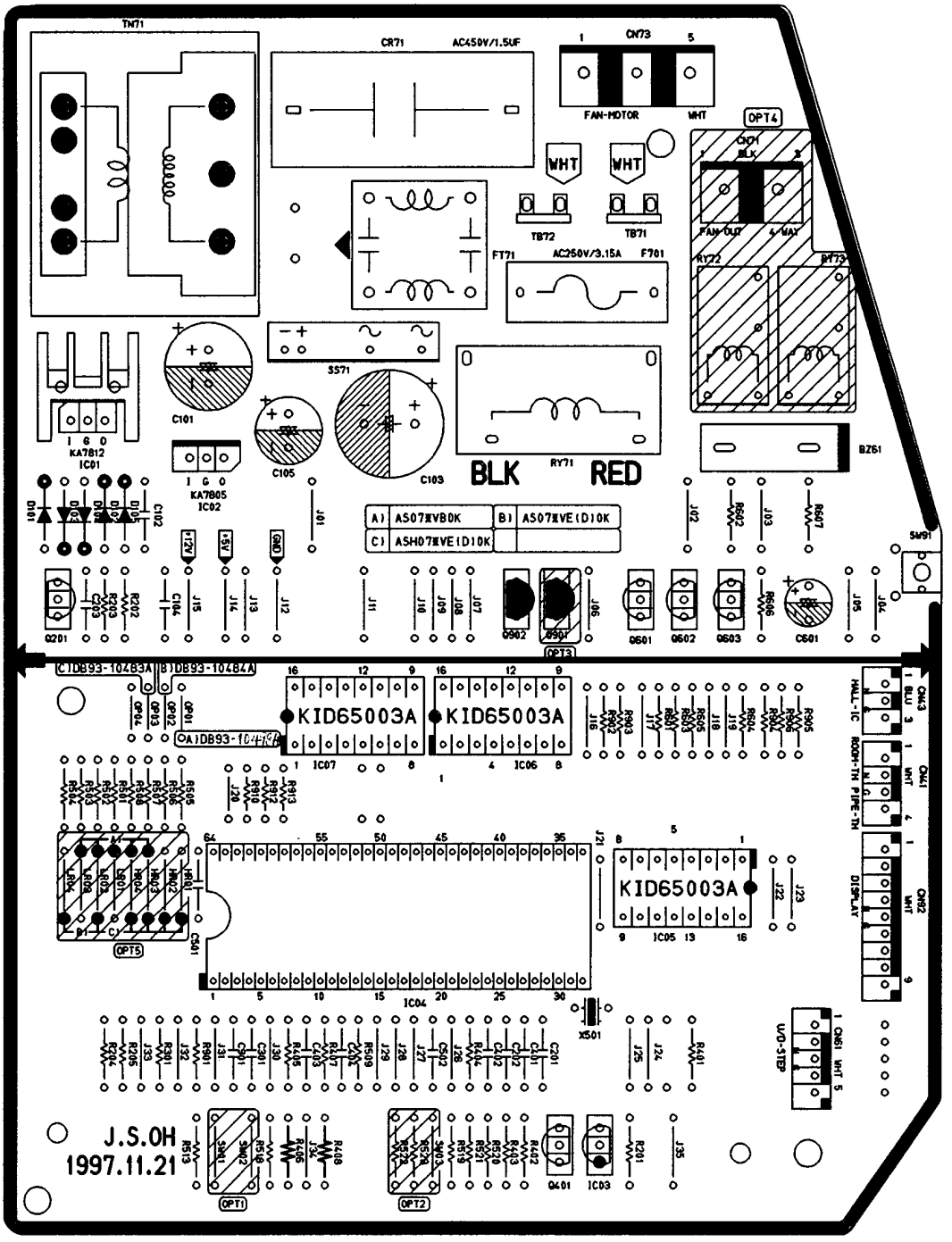
7. Block Diagrams

7-1 Micro Computer Block Diagram



8. PCB Diagrams

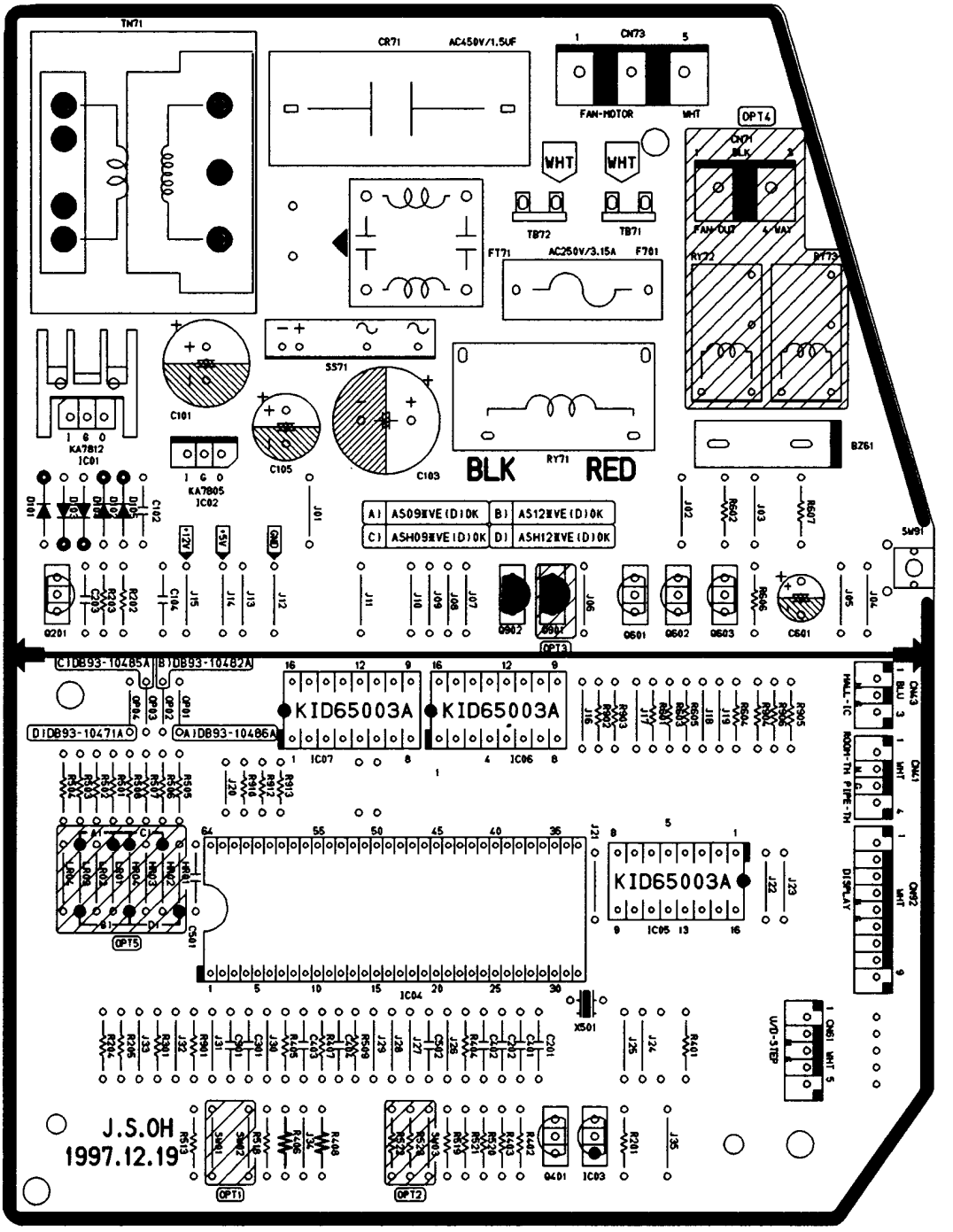
8-1-1 Main PCB-7000Btu(DB93-10484A)



■ PART LIST

No	DESIGN LOCATION	CODE NO	Description	Specification	AS07A1VE	Remark
1	F701	DE32-10037A	FUSE	FST 250V 3.15A	1	
2	F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1	
3	IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1	
4	IC01	DE62-30032A	HEAT-SINK	AL H25	1	
5	IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1	
6	IC02	DE13-10016A	IC-VOLT REGU	KA7805A	1	
7	CR71	2306-000294	C-FILM	CQS 450V 1.5	1	
8	FT71	DE29-90004A	FILTER NOISE	MD250V 1.6A 6mH	1	
9	R903,904,905,906	2001-000776	R-CARBON	RD 1/2 T(S) 821-J	4	
10	R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1	
11	R202,301,409,501~509,513,518~521,601,604,606,902	2001-000065	R-CARBON	RD 1/4 TP 103-J	21	
12	R522	DE39-60001A	WIRE SO COPER	P10.6 SN T 52MM	1	
13	R523	2001-000065	R-CARBON	RD 1/4 TP 103-J	1	
14	R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J	2	
15	R201,204,405,401,402,404,603,606	2001-000042	R-CARBON	RD 1/4 TP 102-J	8	
16	R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1	
17	R602	2001-001088	R-CARBON	RD 1/2 TP 102-J	1	
18	R403	2001-000890	R-CARBON	RD 1/4 TP 682-J	1	
19	R910,912,913	A1000-0244	R-CARBON	RD 1/8 TP 332-J	3	
20	R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F	2	
21	D101~105	0402-000137	DIODE-RECT	1N4007	5	
22	SS71	B4190-0016	THYRISTOR	G3MB-202PL	1	
23	BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1	
24	TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1	
25	TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5	
26	C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z	2	
27	C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z	2	
28	C102,104,201,203,403,404,501,502,902	2202-000780	C-CERAMIC	CA OA 50V 104Z	9	
29	C103	2401-000710	C-ELEC	CE04 25V 222-M	1	
30	C105	2401-001397	C-ELEC	CE 04 25V 471-M	1	
31	C101	2401-000180	C-ELEC	CE 04 35V 102-M	1	
32	C601	2401-001573	C-ELEC	47/50V	1	
33	IC04	DE09-10149A	IC-MCU	MB89635R-466	1	
34	IC03	DE13-20009A	IC	KA7533Z	1	
35	X501	2802-000103	RSONATOR-CERAMIC	10MHz	1	
36	IC05,IC06,IC07	DE13-20024A	IC-DRIVE	KID65003AP	3	
37	Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y	4	
38	Q603	0501-000292	TRANSISTOR	A708Y	1	
39	Q902, Q901	0504-000144	TRANSISTOR	R2002	1	
40	SW91	3404-001013	SWITCH-TACT	KPT-1115V	1	
41	CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1	
42	CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1	
43	CN41	3711-002662	CONNECTOR WAFER	JSW250-02WHT	1	
44	CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1	
45	CN62	3711-000997	CONNECTOR WAFER	SMW250-05BLU	1	
46	CN71		CONNECTOR WAFER	YW396-03AV BLK	0	
47	CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1	
48	TB71,72	DE59-30001A	CONNECTOR-TERMINAL	250TAP,1PIN	2	
49	RY71	3501-001058	RELAY	DI1U DC12V	1	
50	RY72,RY72	B3068-0092	RELAY	JQ1a-12V	0	
51	J1~J35	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	35	
52	HR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
53	HR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
54	HR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
55	HR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
56	LR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	
57	LR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
58	LR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	
59	LR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
60	SW02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	
61	SW01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
62	OP01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	
63	OP02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	
64	OP03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	
65	OP04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	

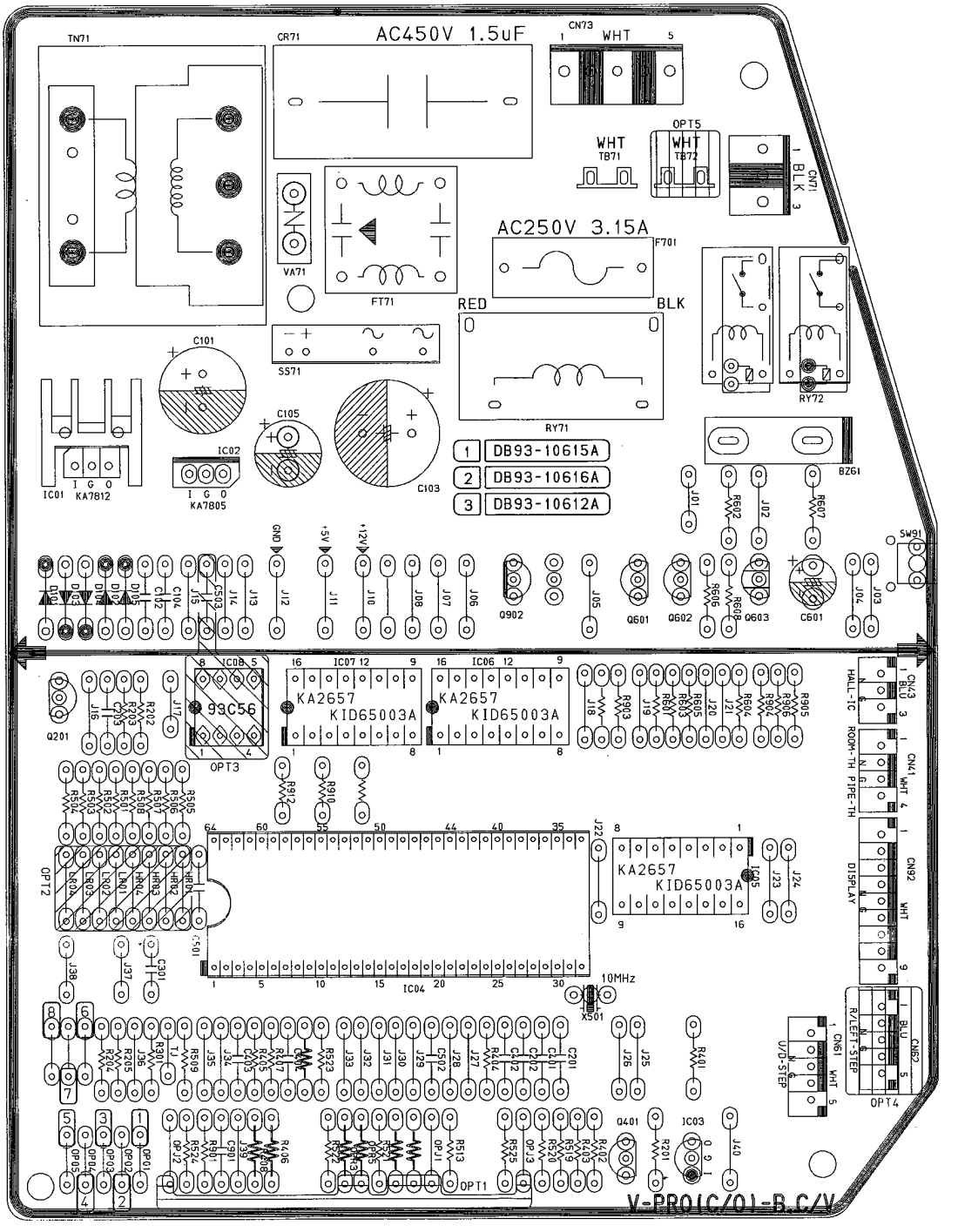
8-1-2 Main PCB-9000Btu(DB93-10486A)



■ PART LIST

No	DESIGN LOCATION	CODE NO	Description	Specification	AS09A1VE	AS12A1VE
1	F701	DE32-10037A	FUSE	FST 250V 3.15A	1	1
2	F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1	1
3	IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1	1
4	IC01	DE62-30032A	HEAT-SINK	AL H25	1	1
5	IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1	1
6	IC02	DE13-10016A	IC-VOLT REGU	KA7805A	1	1
7	CR71	2306-000294	C-FILM	CQS 450V 1.5	1	1
8	FT71	DE29-90004A	FILTER NOISE	MD250V 1.6A 6mH	1	1
9	R903,904,905,906	2001-000776	R-CARBON	RD 1/2 T(S) 821-J	4	4
10	R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1	1
11	R202,301,409,501~509,513,518~521,601,604,606,902	2001-000065	R-CARBON	RD 1/4 TP 103-J	21	21
12	R522	2001-000065	R-CARBON	RD 1/4 TP 103-J	0	0
13	R523	2001-000065	R-CARBON	RD 1/4 TP 103-J	0	0
14	R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J	2	2
15	R201,204,405,401,402,404,603,606	2001-000042	R-CARBON	RD 1/4 TP 102-J	8	8
16	R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1	1
17	R602	2001-001088	R-CARBON	RD 1/2 TP 102-J	1	1
18	R403	2001-000890	R-CARBON	RD 1/4 TP 682-J	1	1
19	R910,912,913	A1000-0224	R-CARBON	RD 1/8 TP 332-J	3	3
20	R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F	2	2
21	D101~105	0402-000137	DIODE-RECT	1N4007	5	5
22	SS71	B4190-0016	THYRISTOR	G3MB-202PL	1	1
23	BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1	1
24	TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1	1
25	TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5	5
26	C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z	2	2
27	C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z	2	2
28	C102,104,201,203,403,404,501,502,902	2202-000780	C-CERAMIC	CA OA 50V 104Z	9	9
29	C103	2401-000710	C-ELEC	CE04 25V 222-M	1	1
30	C105	2401-001397	C-ELEC	CE 04 25V 471-M	1	1
31	C101	2401-000180	C-ELEC	CE 04 35V 102-M	1	1
32	C601	2401-001573	C-ELEC	47/50V	1	1
33	IC04	DE09-10149A	IC-MCU	MB89635R-466	1	1
34	IC03	DE13-20009A	IC	KA7533Z	1	1
35	X501	2802-000103	RSONATOR-CERAMIC	10MHz	1	1
36	IC05,IC06,IC07	DE13-20024A	IC-DRIVE	KID65003AP	3	3
37	Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y	4	4
38	Q603	0501-000292	TRANSISTOR	A708Y	1	1
39	Q902, Q901	0504-000144	TRANSISTOR	R2002	1	1
40	SW91	3404-001013	SWITCH-TACT	KPT-1115V	1	1
41	CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1	1
42	CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1	1
43	CN41	3711-002662	CONNECTOR WAFER	JSW250-02WHT	1	1
44	CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1	1
45	CN62	3711-000997	CONNECTOR WAFER	SMW250-05BLU	1	1
46	CN71		CONNECTOR WAFER	YW396-03AV BLK	0	0
47	CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1	1
48	TB71,72	DE59-30001A	CONNECTOR-TERMINAL	250TAP,1PIN	2	2
49	RY71	3501-001058	RELAY	DI1U DB12V	1	1
50	RY72,RY72	B3068-0092	RELAY	JQ1a-12V	0	0
51	J1~J35	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	35	35
52	HR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	1
53	HR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
54	HR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
55	HR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	1
56	LR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
57	LR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
58	LR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	1
59	LR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
60	SW02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
61	SW01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	1
62	OP01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
63	OP02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
64	OP03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
65	OP04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	1

8-1-3 Main PCB - 9000 Btu(DB93-10616A)
12000 Btu(DB93-10615A)

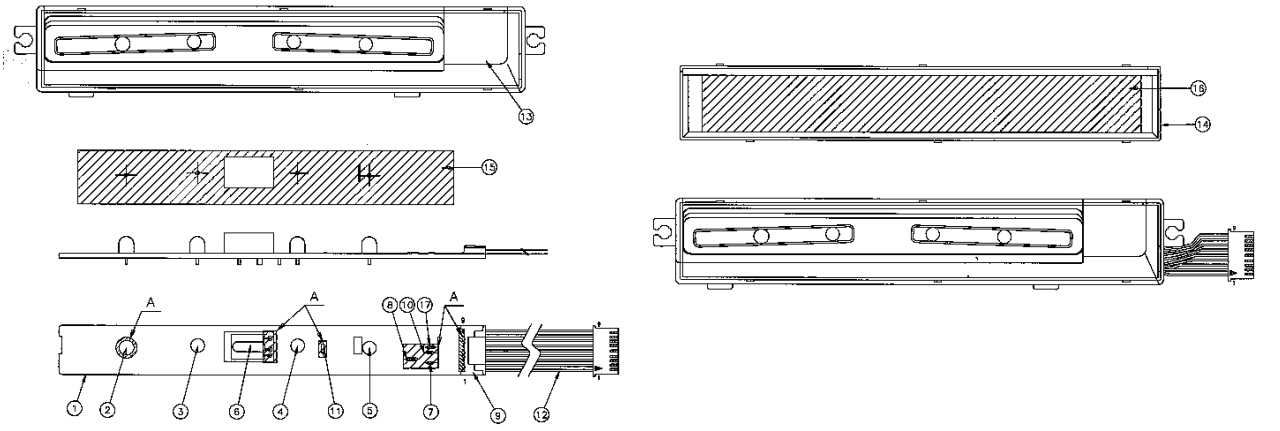


■ PART LIST

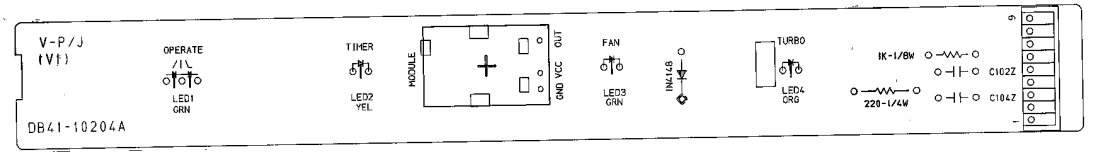
No	DESIGN LOCATION	CODE NO	Description	Specification	AS09A1VB	AS12A1VB
1	F701	DE32-10037A	FUSE	FST 250V 3.15A	1	1
2	F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1	1
3	IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1	1
4	IC01	DE62-30032A	HEAT-SINK	AL H25	1	1
5	IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1	1
6	IC02	DE13-10016A	IC-VOLT REGU	KA7805A	1	1
7	CR71	2306-000294	C-FILM	CQS 450V 1.5	1	1
8	FT71	DE29-90004A	FILTER NOISE	MD250V 1.6A 6mH	1	1
9	R903,904,905,906	2001-000776	R-CARBON	RD 1/2 T(S) 821-J	4	4
10	R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1	1
11	R202,301,409,501~509,513,518~521,601,604,606,902	2001-000065	R-CARBON	RD 1/4 TP 103-J	21	21
12	R522	2001-000065	R-CARBON	RD 1/4 TP 103-J	0	0
13	R523	2001-000065	R-CARBON	RD 1/4 TP 103-J	0	0
14	R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J	2	2
15	R201,204,405,401,402,404,603,606	2001-000042	R-CARBON	RD 1/4 TP 102-J	8	8
16	R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1	1
17	R602	2001-001088	R-CARBON	RD 1/2 TP 102-J	1	1
18	R403	2001-000890	R-CARBON	RD 1/4 TP 682-J	1	1
19	R910,912,913	A1000-0224	R-CARBON	RD 1/8 TP 332-J	3	3
20	R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F	2	2
21	D101~105	0402-000137	DIODE-RECT	1N4007	5	5
22	SS71	B4190-0016	THYRISTOR	G3MB-202PL	1	1
23	BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1	1
24	TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1	1
25	TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5	5
26	C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z	2	2
27	C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z	2	2
28	C102,104,201,203,403,404,501,502,902	2202-000780	C-CERAMIC	CA OA 50V 104Z	9	9
29	C103	2401-000710	C-ELEC	CE04 25V 222-M	1	1
30	C105	2401-001397	C-ELEC	CE 04 25V 471-M	1	1
31	C101	2401-000180	C-ELEC	CE 04 35V 102-M	1	1
32	C601	2401-001573	C-ELEC	47/50V	1	1
33	IC04	DE09-10149A	IC-MCU	MB89635R-466	1	1
34	IC03	DE13-20009A	IC	KA7533Z	1	1
35	X501	2802-000103	RSONATOR-CERAMIC	10MHz	1	1
36	IC05,IC06,IC07	DE13-20024A	IC-DRIVE	KID65003AP	3	3
37	Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y	4	4
38	Q603	0501-000292	TRANSISTOR	A708Y	1	1
39	Q902, Q901	0504-000144	TRANSISTOR	R2002	1	1
40	SW91	3404-001013	SWITCH-TACT	KPT-1115V	1	1
41	CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1	1
42	CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1	1
43	CN41	3711-002662	CONNECTOR WAFER	JSW250-02WHT	1	1
44	CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1	1
45	CN62	3711-000997	CONNECTOR WAFER	SMW250-05BLU	1	1
46	CN71		CONNECTOR WAFER	YW396-03AV BLK	0	0
47	CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1	1
48	TB71,72	DE59-30001A	CONNECTOR-TERMINAL	250TAP,1PIN	2	2
49	RY71	3501-001058	RELAY	DI1U DB12V	1	1
50	RY72,RY72	B3068-0092	RELAY	JQ1a-12V	0	0
51	J1~J35	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	35	35
52	HR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	1
53	HR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
54	HR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
55	HR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	1
56	LR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
57	LR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
58	LR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	1
59	LR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
60	SW02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
61	SW01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	1
62	OP01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
63	OP02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	0
64	OP03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
65	OP04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	1

8-2 ASS'Y DISPLAY & Module

• ASS'Y DISPLAY PCB : DB93-10560A



• PCB-DISPLAY:DB41-10204A



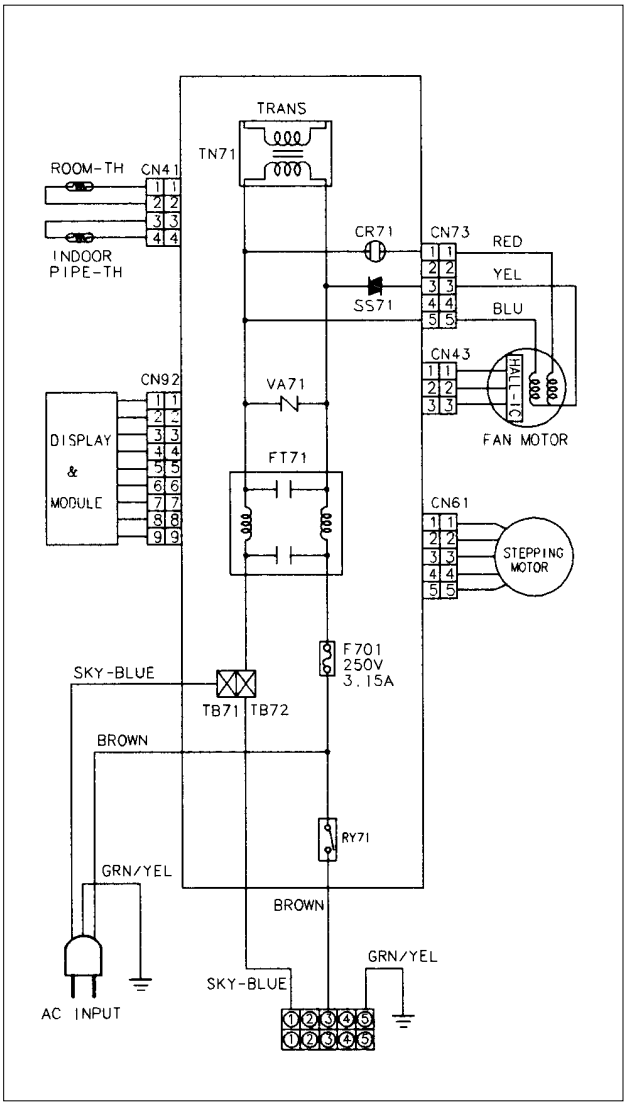
■ PART LIST

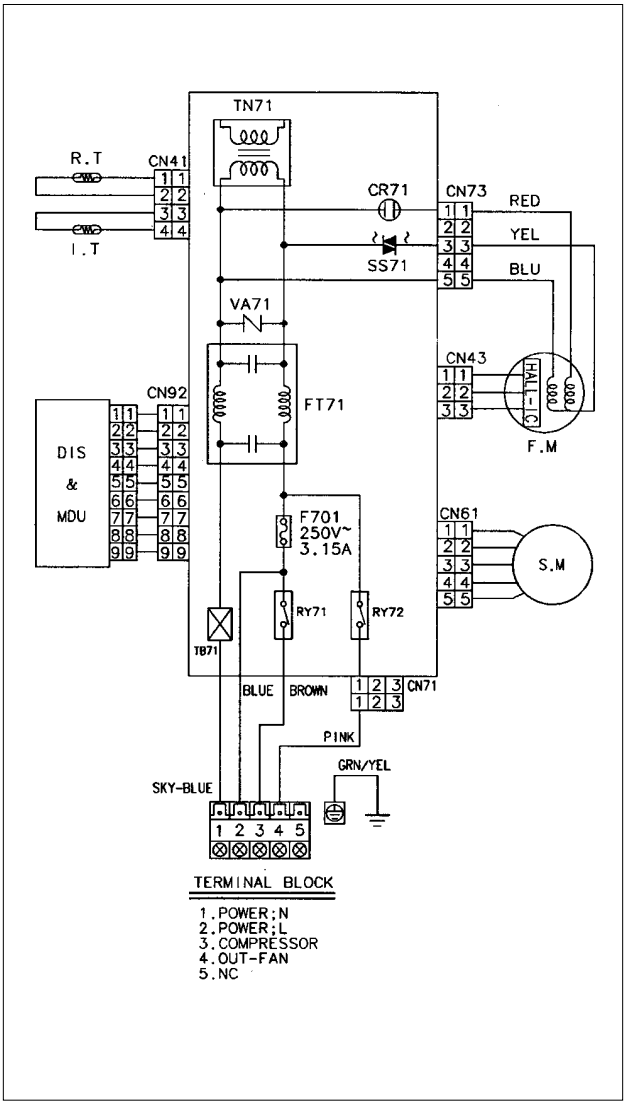
No	Description	CODE-NO	Specification	Q'TY
1	PCB-DISPLAY	DB41-10204A	FR-1 T1.6 W20 L170	1
2	LED-LAMP	DB07-10022A	LTL-52EG-002(ORG/GRN)	1
3	LED-LAMP	0601-001059	SY5511(YEL)	1
4	LED-LAMP	0601-001060	SM5511(GRN)	1
5	LED-LAMP	0601-001196	SO5511(ORG)	1
6	MODULE REMOCON	DB32-50021A	TSOP-1238UU1	1
7	C-CERAMIC	2202-000780	CA OA 50V 104Z	1
8	R-CARBON	2001-000034	RD 1/4TP 221-J	1
9	CONNECTOR WAFER		YWLA200-09P	1
10	C-CERAMIC	2201-000283	CA OA 50V 102Z	1
11	DIODE SWITCHING	0401-000005	1N4148	1
12	C/W DIS & MODULE	DB39-20346A	UL1007 AWG#26/9	1
13	CASE-CENTER PCB UP	DB61-10191A	PC, BLUE	1
14	CASE-CENTER PCB LOW	DB63-10494A	ABS, BLK	1
15	SEAL DISPLAY UPP	DB72-10233A	FOAM-PE, BLK	1
16	SEAL CASE DISPLAY	DB72-10220F	30FOAM-PE	1
17	R-CARBON	2001-000429	RD 1/8TP 102-J	1

9. Wiring Diagrams

9-1 Indoor Unit

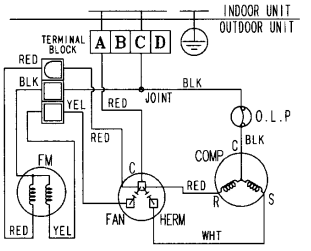
- AS07A1VE
- AS09A1VE
- AS12A1VE
- AS09A1VB
- AS12A1VB





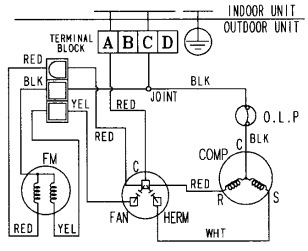
9-2 Outdoor Unit

■ US07A1VE



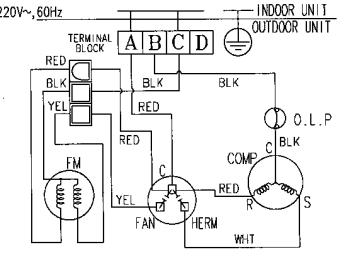
CAPACITOR	US07A1VE: 1.5/25μF X 450VAC

■ US09A1VE



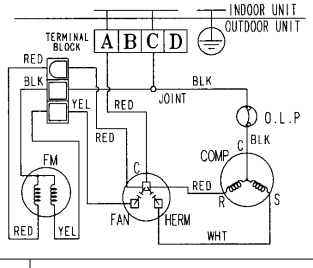
CAPACITOR	US09A1VE: 1.5/30μF X 450VAC

■ AS09A1VB



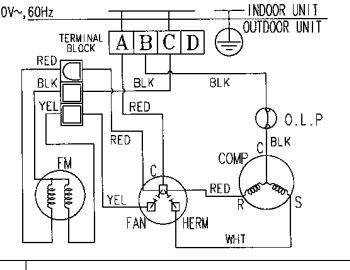
CAPACITOR	US09A1VB: 1.7/20μF x 450VAC

■ US12A1VE



CAPACITOR	US12A1VE: 0.9/30μF X 450VAC

■ AS12A1VB



CAPACITOR	US12A1VB: 1.5/25μF x 450VAC

UPDA TE LOG SHEET

Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

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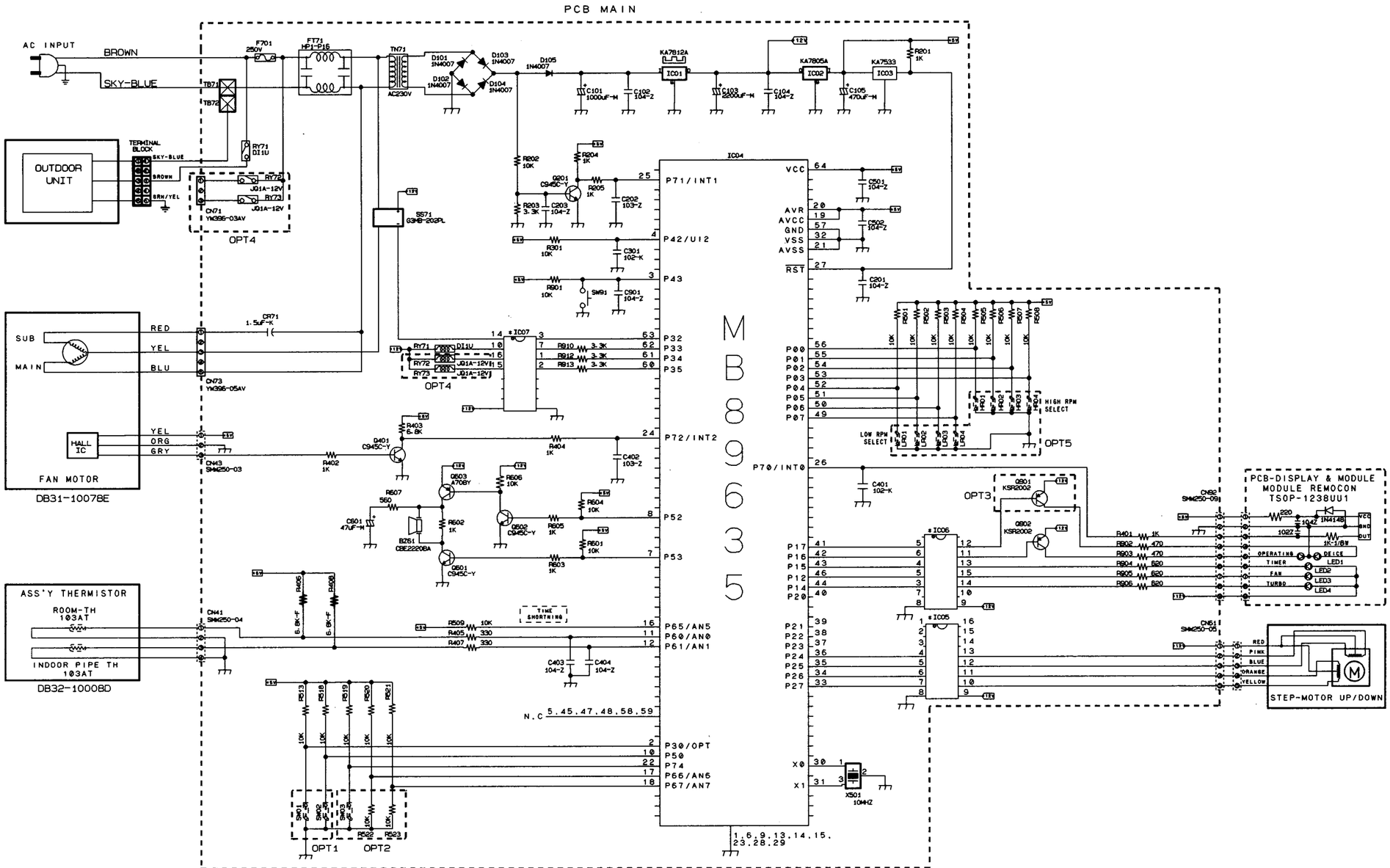
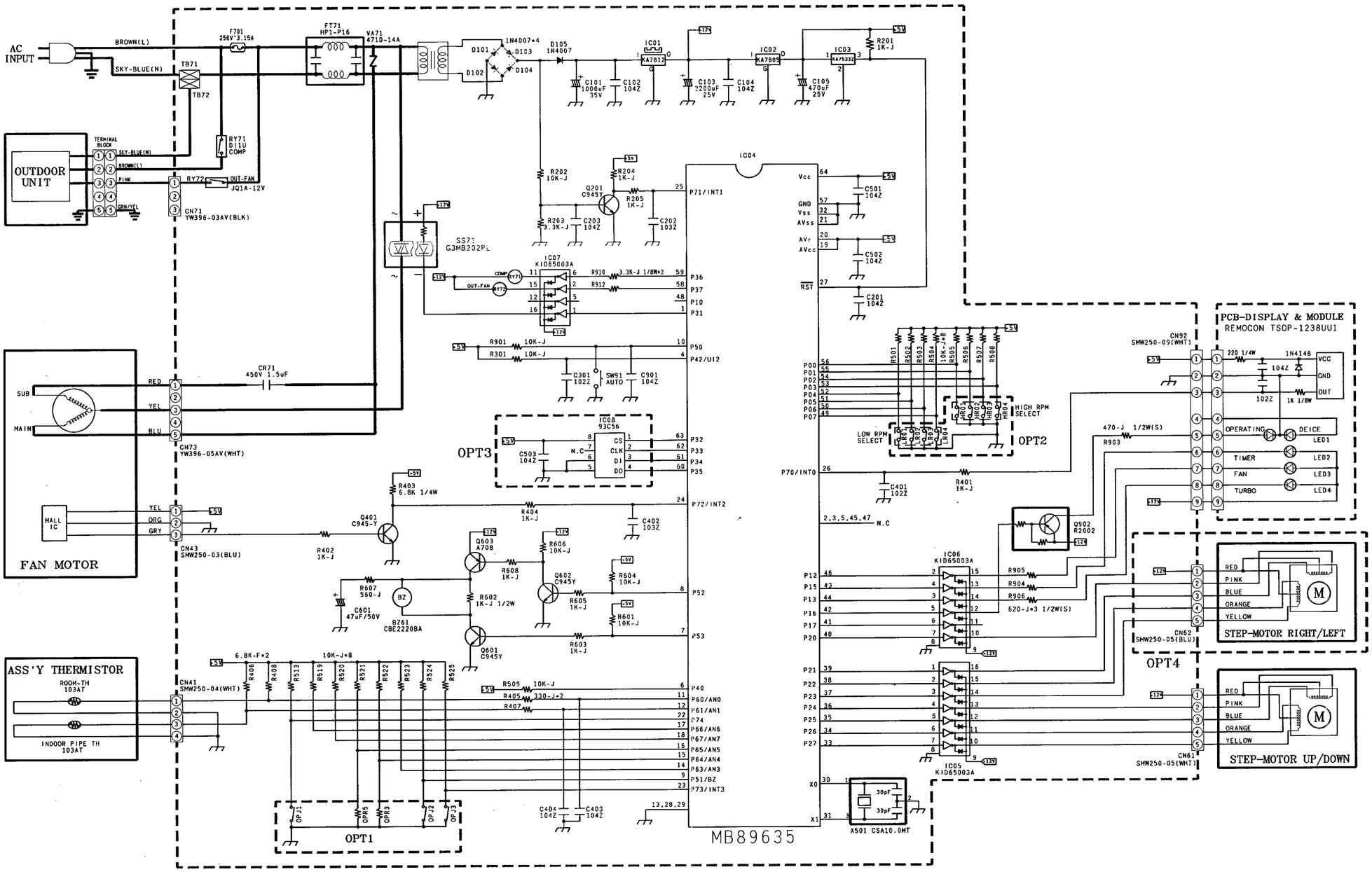
10. Schematic Diagrams

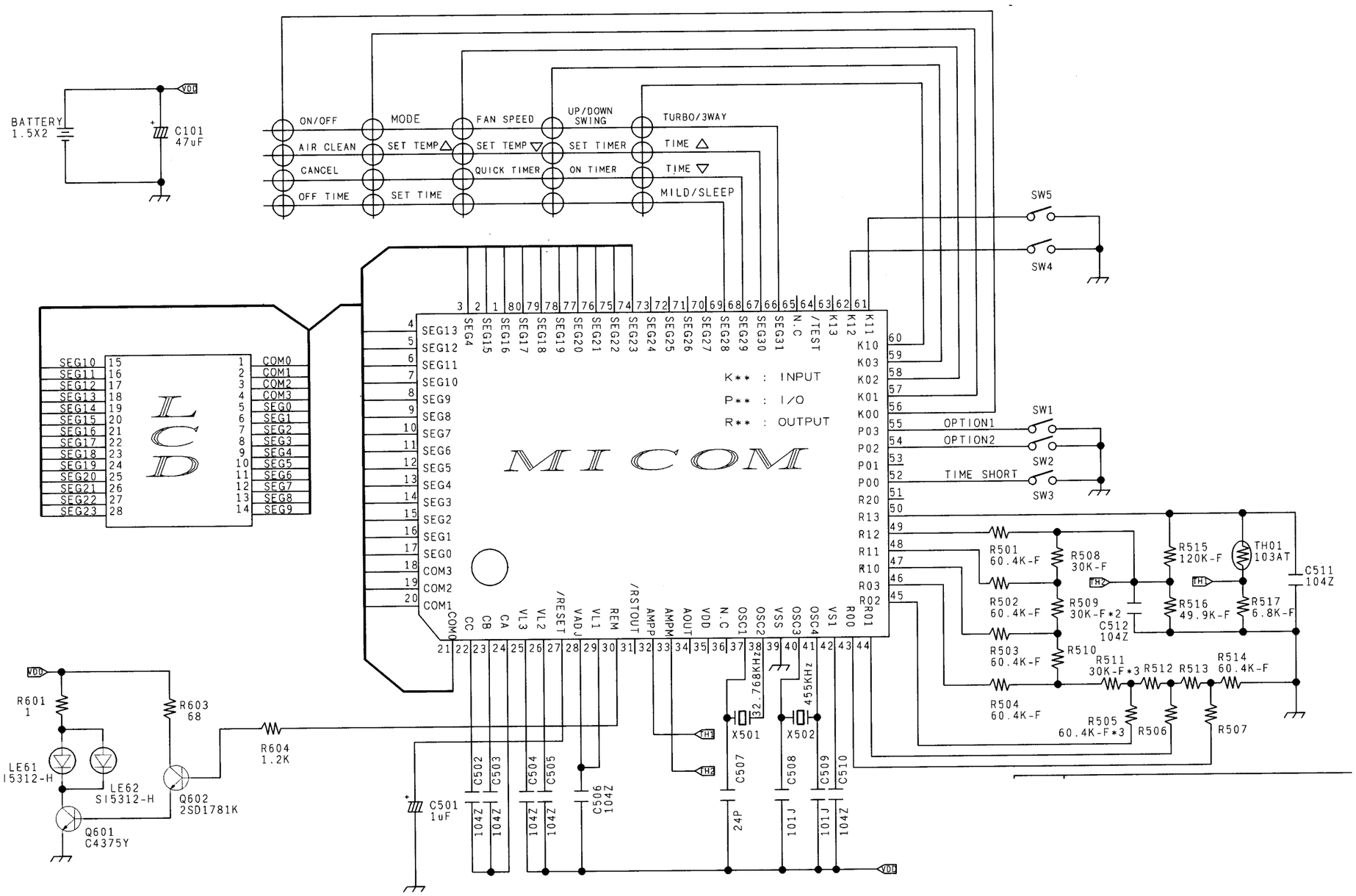
10-1 Indoor Unit

10-1-1 AS07A1VE / AS09A1VE / AS12A1VE



10-1-2 AS09A1VB / AS12A1VB




BATTERY
1.5X2
VDD
C101
47uF
ON/OFF
MODE
FAN SPEED
UP/DOWN SWING
TURBO/3WAY
AIR CLEAN
SET TEMP△
SET TEMP▽
SET TIMER
TIME △
CANCEL
QUICK TIMER
ON TIMER
TIME ▽
OFF TIME
SET TIME
MILD/SLEEP
SW5
SW4
SW1
SW2
SW3
OPTION1
OPTION2
TIME SHORT
K** : INPUT
P** : I/O
R** : OUTPUT
MICOM
LCD
SEG10 SEG11 SEG12 SEG13 SEG14 SEG15 SEG16 SEG17 SEG18 SEG19 SEG20 SEG21 SEG22 SEG23
COM0 COM1 COM2 COM3 SEG0 SEG1 SEG2 SEG3 SEG4 SEG5 SEG6 SEG7 SEG8 SEG9
SEG13 SEG12 SEG11 SEG10 SEG9 SEG8 SEG7 SEG6 SEG5 SEG4 SEG3 SEG2 SEG1 SEG0 COM3 COM2 COM1 COM0
SEG4 SEG15 SEG16 SEG17 SEG18 SEG19 SEG20 SEG21 SEG22 SEG23 SEG24 SEG25 SEG26 SEG27 SEG28 SEG29 SEG30 SEG31 N.C /TEST K13 K12 K11 K10 K03 K02 K01 K00 P03 P02 P01 P00 R20 R13 R12 R11 R10 R03 R02 R01 R00
CC CB CA VL3 VL2 /RESET VADJ VL1 REM /RSTOUT AMPP AMPM AOUT VDD N.C OSC1 OSC2 VSS OSC3 OSC4 VS1
32.768KHz
455KHz
X501
X502
R501 60.4K-F
R502 60.4K-F
R503 60.4K-F
R504 60.4K-F
R505 60.4K-F*3
R506
R507
R508 30K-F
R509 30K-F*2
R510
R511 30K-F*3
R512
R513
R514 60.4K-F
R515 120K-F
R516 49.9K-F
R517 6.8K-F
TH01 103AT
C511 104Z
C512 104Z
R601 1
R603 68
R604 1.2K
LE61 SI5312-H
LE62 SI5312-H
Q602 2SD1781K
Q601 C4375Y
C501 1uF
C502 104Z
C503 104Z
C504 104Z
C505 104Z
C506 104Z
C507 24P
C508 101J
C509 101J
C510 104Z